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Railway Age

ANNUAL STATISTICAL AND OUTLOOK NUMBER

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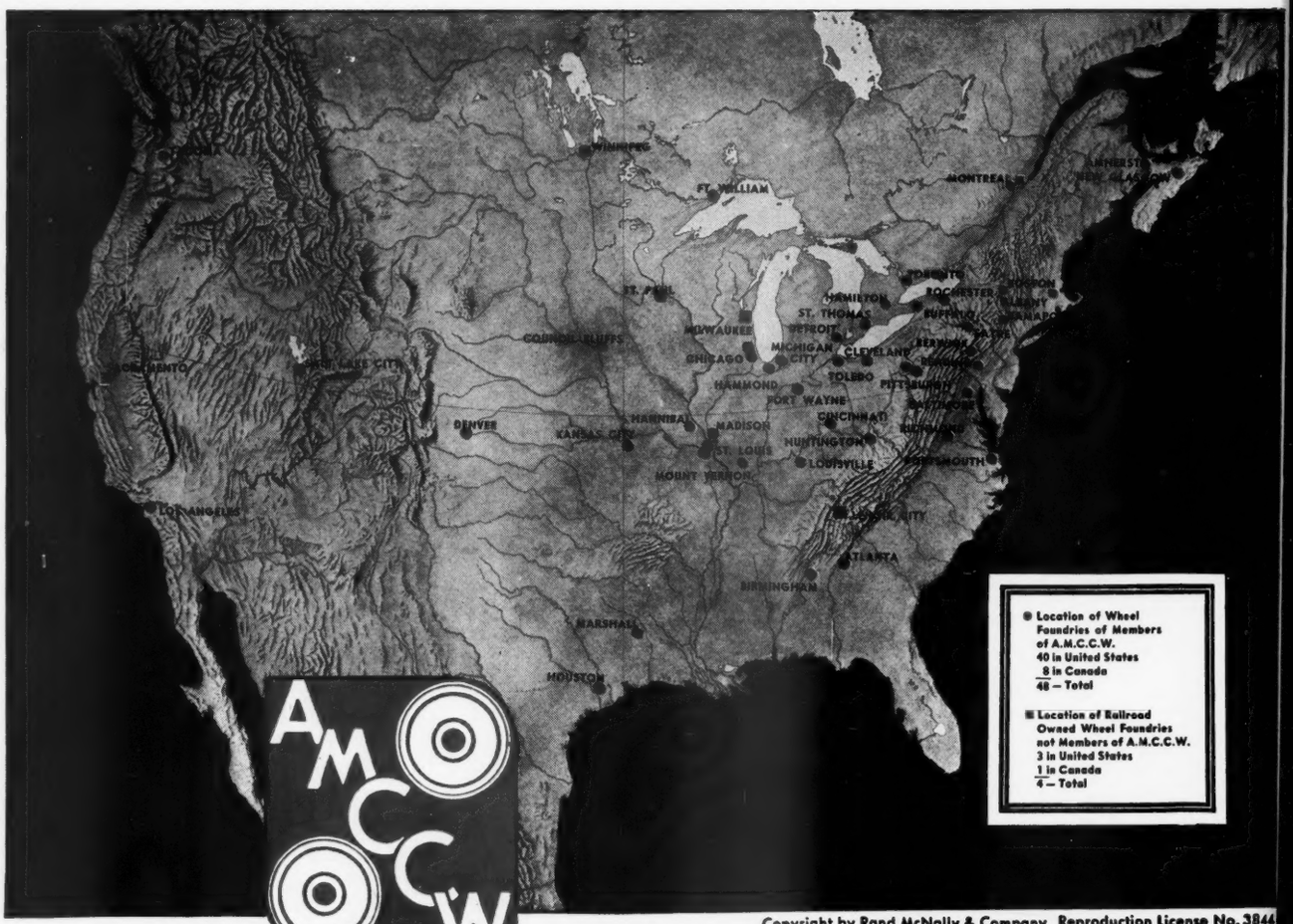

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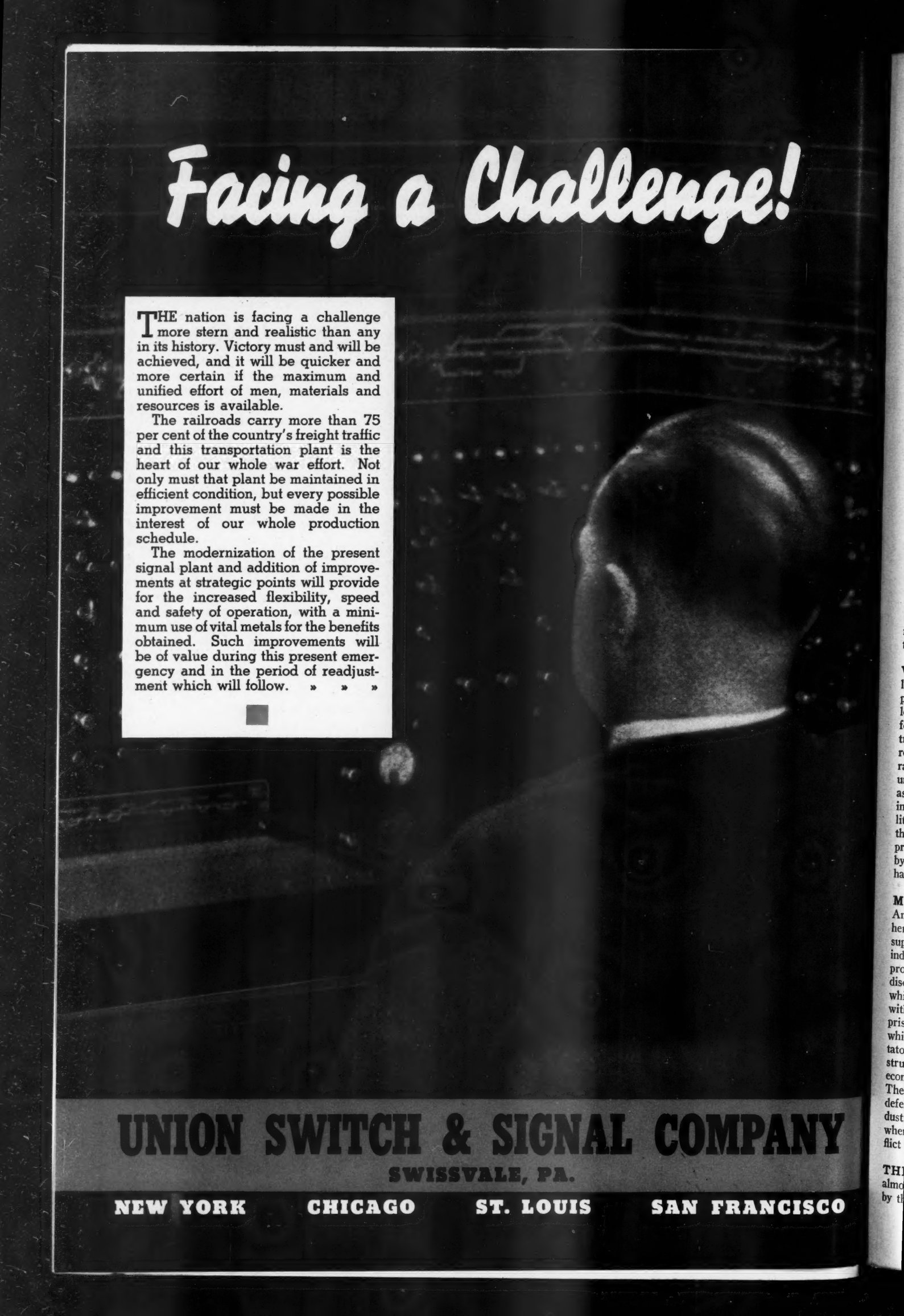
Facing a Challenge!

THE nation is facing a challenge more stern and realistic than any in its history. Victory must and will be achieved, and it will be quicker and more certain if the maximum and unified effort of men, materials and resources is available.

The railroads carry more than 75 per cent of the country's freight traffic and this transportation plant is the heart of our whole war effort. Not only must that plant be maintained in efficient condition, but every possible improvement must be made in the interest of our whole production schedule.

The modernization of the present signal plant and addition of improvements at strategic points will provide for the increased flexibility, speed and safety of operation, with a minimum use of vital metals for the benefits obtained. Such improvements will be of value during this present emergency and in the period of readjustment which will follow. » » »



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Prospect and Retrospect

NOW AND 1918: How much better off the country is from a transportation standpoint now, than in World War I, is surveyed in detail in the leading editorial herein. The railroads in the first nine months of 1941 handled 14 per cent more ton-miles, and without congestion, than they did with congestion in 1918—and they did the job with 31 per cent fewer freight engines and 22 per cent fewer freight cars. The editorial foresees a probable *shortage in passenger facilities,* likely to arise because of the prohibition of rubber for automobile tires.

●

WARNING FROM EASTMAN: Director Eastman of the ODT, in a message to railroaders herein, warns that "the remarkable accomplishments of 1941 will have to be surpassed"—and bespeaks the co-operation of railroad men with his Office to that end.

●

ANALYSIS BY BUDD: The retiring Defense Transportation Commissioner in an article elsewhere in these pages reviews the transportation facilities of the country and discloses the probable coming traffic demands on the railroads and the equipment and materials which will be needed to meet them. Transportation, he explains, is an integral part of our war machine, and its capacity must be expanded in even ratio to the expansion of the machine as a whole.

●

WHAT WILL NET BE IN '42?: Carloadings at not less than 44.5 millions and, probably, not more than 46.6 millions (unless the short work-week is ended) are foreseen in a study, presented herein, of traffic and revenue prospects for 1942. The revenue possibilities cover a much wider range than traffic, however, because of the unknown factor of rates. If these are raised as much as the carriers ask, net operating income in 1942 may be as large or even a little larger than in 1941—but a failure by the railroads to secure substantial increases promptly will reduce net operating income by the difference between what the roads have asked for and what they actually get.

●

MUNITIONS FOR UNCLE SAM: America is confident of her ability to lick her totalitarian enemies — because of the superior productive capacity of American industry. A very considerable part of this productive superiority, as an article herein discloses, lies in the plants of the industries which were built up to supply the railways with equipment and materials. Free enterprise built these plants, and no government which has relied on socialism or other dictatorial economic policies can bring to this struggle the industrial resources with which economic freedom has endowed this people. The article is specific, telling what kind of defense materials are produced by what industries—a record which may be historical when the final account of the present conflict is set down.

●

THE ARMY ON STEEL: Soldiers—almost at the 1918 volume—were handled by the railroads in 1941 with skill and dispatch which far excelled the last war's performance. The magnitude and variety of the railways' direct participation in military manoeuvers is presented in an article in this issue—with as much detail as it is proper to give about the organization which is producing so smoothly this remarkable movement.

●

TRACKAGE FOR DEFENSE: The construction of vast new plants to produce defense goods, and the large number of new military establishments, have required the construction of much mileage of connecting trackage—some of it laid down in difficult spots. How the engineering questions encountered in this work have been answered in specific cases is outlined in an illustrated article herein.

●

HOW MUCH POWER & CARS?: The best performance the railroads have ever been able to secure from their car supply is compared with prospective 1942 peak demands in an analysis herein—to arrive at as close an estimate as possible of the number of cars the railroads *must* have in coming months, to avoid embarrassment. A companion article makes a similar appraisal of the motive power situation. No cause for panic in the outlook—but no occasion for undue assurance either. Informed vigilance is needed here, and there'll be "no discharge in the war."

●

RR-MADE MUNITIONS?: Our staff specialist on railway shop questions draws attention to the fact that 24-hour, 7-days-a-week operation would increase output of shop tools, perhaps, three-fold—compared with single-shift operation. The suggestion is made that the idle hours on railway machines be used in munitions work—thereby accelerating the defense program; and, incidentally, getting useful service out of these machines before obsolescence overtakes them.

●

DOCTOR PARMELEE: The Director of the Bureau of Railway Economics has his usual comprehensive annual statistical presentation of the past year's railway operations on another page herein—its outstanding characteristic being that the statistical data there presented are given (on the basis of careful estimates) for the entire year. Until complete figures are available six weeks or more hence, this article will, as always, be the best and handiest summary to be had of all the important statistical information on the year's railway performance.

●

MORE CONSTRUCTION IN '41: There was more new construction—track and structures—on the railroads last year than in any similar period in a decade. New route mileage was only 54, and multiple trackage only 12, but some of the jobs the railroads have done or have now in hand are pretty intensive. Miles abandoned totaled over 1,500—another sign of progress, in that cessation of operation of such lines represents the removal of a drain on railway net revenues.

1.6 BILLION OF RR BUYING: Purchases by and in behalf of the railroad industry in 1941 ran to more than 1.6 billion dollars—compared with 1.1 billions in 1940. Details, by kinds of materials (and by classes of railroads), are presented, tabulated and charted by our purchases and stores editor elsewhere in this issue.

●

PRICES MOVE UPWARD: With 1914 prices taken as 100, 1941 prices averaged 189—as compared with an index of 179 in 1940. Details, by important classes of goods purchased, are charted and tabulated on another page herein.

●

131,670 FREIGHT CARS: For service in the United States, the railroads, the government and private car lines in 1941 ordered 118,371 freight cars. Canadian orders totaled 7,578 and export orders 5,721—giving a grand total of 131,670 of freight car business for North America, which tops 1929 by more than 7,000 cars.

●

1,849 LOCOMOTIVES: 1,436 engines were ordered in 1941 for service in the United States; 334 were purchased for export (largely "lend-lease"); and 79 were ordered from Canada's builders. Of the orders for domestic service—302 of the units were steam, 1,096 were Diesels and 38 electrics. The number of locomotives (as well as freight cars) built—in contrast to orders—is not quite such a bright picture, as our analyses herein reveal.

●

639 PASSENGER CARS: While records of many years' standing were broken in motive power and freight rolling stock orders, the passenger car market in the latter months of the year lost its zip (because of the policy of the priority authorities). At that, 1941 passenger car orders were exceeded since 1929 only by those of 1930 and 1937.

●

SIGNALING: Although slightly less in volume than in 1940, signaling installations in 1941 exceeded those of any other year since 1931—such is the revelation in the annual report on these installations, set forth elsewhere in this issue.

●

TRANSPORT BALANCE: Probably no more helpful characterization could be made—to promote understanding of the relation of transportation to the nation's war effort—than Ralph Budd's observation that *production and transportation are now in balance.* That is, capacity use of the transportation plant is equal to (neither more nor less than) the war effort's needs for transportation. If this accurate concept is kept in mind, it becomes instantly clear that any desired increase in defense production must be paralleled with a proportionate increase in transportation capacity. As well try to build more tanks and planes and ships without proportionately more steel, as to expect to produce them without more transport (and, of course, the materials it takes to produce more transport).

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RAILWAY AGE

1941—Railway Review and Outlook—1942

The year 1941 was one of the most important and critical in the history of our railways. The government's spending for defense got well under way in the second half of 1940, and was certain to increase rapidly throughout 1941. The railways had much less equipment than a decade before; and estimates were made by some in official Washington that traffic would increase so much more than available equipment that the carriers would be swamped. Predictions were freely made of a large car shortage, and consequent adoption of government operation as in 1918.

Some of these predictions were fulfilled. Government spending for defense increased so fast that in 1941 it was about 16 billion dollars, as compared with government spending for war in 1918 of only about 12 billion. Owing directly and indirectly to this there was in 1941 the largest increase in demand upon the railways for freight transportation that ever occurred, and also a large increase in demand for passenger transportation. Revenue ton-mileage increased over 1940 by 26 per cent, or 97 billion—from 373 billion to 470 billion. The largest previous increase (in 1916) was 77 billion. But the predictions that the railways would be swamped, would have a large car shortage and would be threatened with, or actually subjected to, government operation, failed of fulfillment. They maintained in 1941 a freight car surplus which ranged from as high as 190,000 during the coal strike in April to as low as 40,600 at the peak of traffic in October. The only time they seemed in any danger of government operation was when they were threatened with a strike of their employees in November during the wage dispute. Of all the great primary defense industries, they came through 1941 with the least complaint and the most praise of their performance from both government and private sources.

1918 and 1941—A Contrast in Transportation

On December 23 President Roosevelt announced creation of the Office of Defense Transportation and the appointment of Joseph B. Eastman, chairman of the Interstate Commerce Commission, as director. This was almost exactly twenty-four years after President Wilson on December 26, 1917, issued a proclamation adopting government operation of railways effective on December 28, and appointing William G. McAdoo, Secretary of the Treasury, also Director General of Railroads. The circumstances in which the two policies were adopted, however, were widely different; and, consequently, between the two policies adopted there are corresponding differences. These differences in circumstances and in the policies adopted cannot be too strongly emphasized at the present time.

Nineteen Months of War in 1917-1918; Nineteen Months of Preparation in 1940-1941

The United States entered the first World War in April, 1917. There has been no other difference in economic conditions in this country so great as in the transportation situation then and recently. The United States had made virtually no preparations or expenditures for participating in World War I, and there had been virtually no increase in production for that purpose. Nevertheless, throughout the first quarter of 1917 there had already been the most serious shortage of transportation that had ever existed up to that time. The American Railway Association reported the following net shortages of freight cars on the first day of each of the first four months of 1917: January, 62,000; February, 110,000; March, 131,000; April, 145,000. These shortages were due to a vast expansion of production and commerce in the preceding decade owing to which, and to the load added by war demands from Europe in 1914-1916, the freight traffic actually handled by the railroads increased 64 per cent in 1916 over 1906.

The Railroads' War Board, in spite of great difficulties largely created by government transportation priority orders, succeeded in 1917 in increasing freight movement 9 per cent. But this was not enough to meet the already greatly increased, and still rapidly increasing, demand for service. Furthermore, the railways

were becoming confronted in the latter part of 1917 with labor troubles, and with financial difficulties due to advancing prices as well as to demands for advances in wages. Therefore, President Wilson decided for government operation with government guarantees "that the railroads shall receive a net operating income equal in each case to the average of the three years preceding June 30, 1917." Under government operation in 1918, during ten months of which the country was at war, the movement of freight was increased only 3 per cent; while gross earnings, largely due to advances in rates, increased 21 per cent, or 870 million dollars, and operating expenses 40 per cent, or 1 billion 200 million dollars.

It happens by a coincidence that this country, without having previously made any preparations, participated in World War I nineteen months in 1917-1918, and that it has been arming for participation in this war also nineteen months. And, as figures already given show, the government actually spent about one-third more for defense and war in 1941 than for war in 1918. But, because of—and also in spite of—the prolonged depression, there was a large surplus of transportation when it began at the middle of 1940 preparing for World War II. Instead of a net freight car shortage of 145,000, as on April 1, 1917, the railways had a net freight car surplus of 150,000 on June 1, 1940.

Changed Conditions Faced by Director Eastman

This surplus of equipment existed because, in spite of the great decline in amount of equipment during the depression, the railways were otherwise well prepared for meeting the emergency. They had added 8 billion dollars to their investment since 1916, which had greatly expanded and improved all the facilities used in moving equipment. While they had fewer locomotives and cars, the equipment they had was better. They had profited by their experience in the last war by organizing the Association of American Railroads and giving it centralized control over the distribution and movement of equipment. The shippers had Regional Advisory Boards that were experienced, expert and co-operative in forecasting traffic and helping expedite the loading and unloading of cars. Government, railroads and shippers recalled the demoralizing effects of transportation priority orders during the last war, and Army, Navy and other government departments co-operated from the beginning of the defense program in preventing accumulations of loaded cars at ports and elsewhere. Consequently, under the supervision of Ralph Budd, Commissioner of Transportation for the government, the railways succeeded in 1941 in furnishing with entire satisfaction to government authorities and private shippers the largest freight service ever rendered.

Thus Mr. Eastman becomes Director of Transportation facing conditions and problems widely different from those that confronted the Railroads' War Board in 1917 and the Railroad Administration in 1918; and the authority and duties given him are correspondingly different from those of the Director General in 1918.

No Present Prospect of Government Operation

The government does not take over operation of the railways; and there is no present prospect that it will. The Director General's authority extended over only the railways, but over them it was complete. Director Eastman's authority and duties extend over all branches of domestic transportation, but apparently relate only to defense traffic—although he is, of course, empowered to so direct defense traffic as to prevent any interference of commercial traffic with it. He is to co-ordinate the transportation activities of all federal government agencies, and also of all railroad, motor, inland waterway, pipe line, air, coastwise and intercoastal carriers to assure "maximum utilization of the domestic transportation facilities of the nation." He will advise the Supply Priorities and Allocations Board on requirements of the various means of transportation, and recommend allocations of materials and equipment needed to "stimulate the provision of necessary additional transport facilities and equipment." He will represent the defense interests of the government in fixing rates for transportation, although he must collaborate with the Interstate Commerce Commission in doing so.

Probably it was inevitable that during the actual conduct of war a government official not previously identified with any one branch of transportation would be given direction of all branches. In the circumstances of the last year and a half no man could have given the government more efficient service as Commissioner of Transportation than Ralph Budd has given. And it can be said with equal confidence that no public official could now have been selected for Director of Transportation with as much satisfaction to all transportation and shipping interests as the man appointed.

A Wise Choice for Director of Transportation

Director Eastman has always been a liberal. Twenty-three years ago, when he was appointed to the Interstate Commerce Commission, he was an advocate of government ownership of railways and was regarded by conservatives as a radical. But throughout these years he has been a thorough student of transportation, a very hard worker, of unquestioned integrity, judicial in his approach to all problems, and consequently he long since became recognized as the ablest and best-equipped man that ever served on the Interstate Commerce Commission. Recent utterances indicate that he believes the railways have been doing a good job and need only constructive governmental assistance to continue doing it. Consequently, although we do not recall that Mr.

Eastman ever has expressly said he no longer favors government ownership, we believe his appointment can reasonably be construed as a move away from rather than toward government operation.

Any review of developments in 1941 would be inadequate if it did not analyze and emphasize how the railways achieved the great increase in efficiency of operation which enabled them to handle an unprecedentedly large and unprecedentedly increased freight traffic so satisfactorily. They were government-operated in 1918, the second year of our participation in World War I. Their largest freight traffic previous to 1941 was handled in 1929. As respects government, industrial and transportation activities for defense and war, the year 1941 in the present period corresponds with 1918 in the last war period. Therefore, in the table on the following page we give statistics comparing railway freight handling performance in the first nine months of 1918, 1929 and 1941—later statistics for 1941 being as yet unavailable.

Unprecedented Railway Efficiency in 1941

There are two kinds of freight, "revenue" and "non-revenue," the latter being principally that handled by the railways for themselves. As the two kinds are handled in the same cars and trains, they must be combined to get measures of freight operating efficiency. The total number of tons of both revenue and non-revenue freight carried one mile in the first nine months of 1941 was but slightly larger than in 1929, but 14.2 per cent larger than in 1918. The figures showing with what a reduced amount of equipment 1941 traffic was handled are highly significant. Because of declines during the depression, the railways had last year almost 26 per cent fewer freight locomotives than in 1929 and 31 per cent fewer than in 1918. They had on line (including those privately-owned) 23.4 per cent fewer freight cars than in 1929 and 22.3 per cent fewer than in 1918. But, on the average, each freight locomotive moved 32.3 per cent more miles than in 1929 and almost 32 per cent more than in 1918. Average load per loaded freight car was 5.6 per cent larger than in 1929, but 2.4 per cent smaller than in 1918; but average number of cars per train was 3½ per cent larger than in 1929 and 46.2 per cent larger than in 1918. Consequently, the average number of tons hauled per train was 13 per cent larger than in 1929 and 34.2 per cent larger than in 1918. Also, on the average, each freight car moved 22 per cent more miles than in 1929 and 60 per cent more than in 1918.

With locomotives hauling larger loads and covering more miles daily, and with freight cars also moving more miles a day, there were very much larger increases in the average amount of service rendered with each locomotive and each freight car. Measured by ton-miles, each locomotive, on the average, rendered 35.7 per cent more service daily in 1941 than in 1929 and 65.5 per cent more than in 1918. Also, on the average, each freight car in 1941 rendered 31.5 per cent more service daily than in 1929 and 47 per cent more than in 1918.

Remarkable Operating Records

The increase in the efficiency with which locomotives and cars were used may, perhaps, be more strikingly indicated by the following facts: The railways had 31,544 freight locomotives in 1918 and only 21,754 in 1941. If each freight locomotive in 1941 had rendered only as much service as each did in 1918 there would have been required 36,023 locomotives last year—65 per cent, or 14,267, more than were actually available. The railways had on line last year an average of 1,890,313 freight cars; and if each freight car had rendered only as much service as each did in 1918, there would have been required 2,776,650 cars—that is, 47 per cent or 886,337 more than were actually available. Also, if each locomotive and freight car had rendered in 1941 only the same service that each did in 1929 there would have been required last year about 7,600 more locomotives and 570,000 more freight cars than were available.

The operating conditions were probably the most favorable in history to accomplishing this phenomenal increase of efficiency, because there was such an abnormally large traffic moving by main line between large centers of production, as compared with the traffic that had to be assembled from and delivered to small communities on branch lines. Nevertheless, the achievement was a very great one—so great as to confound all critics of the railroad industry as "obsolete" and "decadent."

Purchases of Equipment and Materials, $1,250,000,000

The unprecedented increase in traffic was accompanied by corresponding increases in gross earnings, operating expenses, taxes, net operating income (until the wage increases effective September 1) and purchases. Gross earnings of about 5⅓ billion dollars were 24 per cent larger than in 1940 and the largest since 1930—although more than 1 billion dollars smaller than in 1929. Operating expenses of almost 3 billion 700 million were about 20 per cent larger than in 1940, and also the largest since 1930. Taxes of 554 million were 40 per cent larger than in 1940 and much the largest in history, exceeding those of 1929 by 157 million. Net operating income of about 1 billion was almost 50 per cent larger than in 1940 and the largest since 1929, although 275 million less than in 1929.

Confronted with the necessity of greatly increasing service, and having a large increase in net earnings with which to buy, the railways placed in 1941 the largest orders for equipment and materials since 1929, and may be found, when complete data are available, to have exceeded orders in 1929. In an article else-

where in this issue the Class I roads are estimated to have received materials from manufacturers costing 824 million dollars—these materials including those received by the railways for building locomotives and cars in their own shops. They are also estimated to have placed orders with locomotive and car builders for equipment that will cost 424 million dollars. Thus, their total purchases of materials and equipment approximated 1¼ billion dollars. Corresponding figures for 1940 are, materials, 582 million and equipment, 251 million—a total of 833 million. These total purchases in the ten years ending with 1940 averaged about 551 million annually. Thus, their increase in 1941 over 1940 was 50 per cent and over the average of the preceding ten years was 126 per cent. The foregoing statistics, as stated, are for Class I roads. Purchases of equipment and materials by all railroads and car lines are estimated at 1 billion 310 million in 1941, as compared with 870 million in 1940.

1941 Railroad Performance Compared with 1929 and 1918

	First 9 months of			Increase or Decrease 1941 compared with	
	1918	1929	1941	1918	1929
Net ton-miles (rev. and non-rev.) (thousands)	326,307,000	369,691,000	372,801,000	+14.2	+ 0.8
Locomotives in road freight service	31,544	29,248	21,754	–31.0	–25.6
Locomotives in bad order	4,698	4,823	4,511	– 4.0	– 6.5
Per cent locomotives in bad order	14.9	16.5	20.7	+38.9	+25.5
Freight Cars on Line (Inc. private cars)	2,433,144	2,466,451	1,890,313	–22.3	–23.4
Freight cars in bad order	138,501	150,454	95,533	–31.0	–36.5
Per cent freight cars in bad order	5.7	6.1	5.1	–10.5	–16.4
Average miles per locomotive per day	65.0	64.8	85.7	+31.8	+32.3
Average number cars per train	34.4	48.6	50.3	+46.2	+ 3.5
Average tons per loaded car	29.0	26.8	28.3	– 2.4	+ 5.6
Average tons per train	678	808	910	+34.2	+12.6
Total freight train-miles	481,386,000	457,553,000	413,974,000	–14.0	– 9.5
Average miles per car per day	25.0	32.4	40.0	+60.0	+21.9
Average ton-miles per locomotive per day	37,895	46,250	62,773	+65.5	+35.7
Average ton-miles per car per day	491	549	722	+47.0	+31.5

Large Purchases Must Continue in 1942

There was, because of inability to get materials, an unusual disparity between the volumes of equipment ordered and built. The number of locomotives ordered was 1,436, and the number built only 1,047—the largest number ordered since 1923, and the largest number built since 1926. The number of freight cars ordered was 118,371 and the number built 79,396—the largest number ordered since 1924, but only the largest number built since 1930. The number of passenger cars ordered was 548 and the number built 229—both the largest since 1937, but both substantially smaller than in that year.

A large part of the equipment ordered in 1941 will have to be built in 1942, as there were about 600 locomotives and 75,000 freight cars still on order at the end of 1941. But this does not mean that there will not be large orders placed in 1942. Even if all shop capacity should be required to build equipment now on order before October 1, 1942, to enable the railways to cope with next fall's peak traffic, there would still have to be large amounts of equipment as well as materials ordered throughout 1942 to provide for meeting the continued increased demands for service expected in 1943. Consequently, buying of equipment and materials may reasonably be expected to be as large or larger in 1942 as in 1941, if it is not to be restricted, as it was in 1941, by failure to allocate sufficient materials to the railways and manufacturers for them; and Director of Transportation Eastman apparently will have authority to prevent such failure.

Under present and prospective abnormal conditions, all forecasts of traffic, freight or passenger, and of railway earnings are likely to prove highly erroneous. We have recently read from equally authoritative government sources estimates of war production in 1942 ranging from 32 billion to 45 billion dollars. Stacey May, chief of the OPM Bureau of Research and Statistics, who made the estimate of 45 billion for war, also estimated a national income in 1942 of 110 billion dollars—both estimates being based on current prices. A total production and national income of 110 billion in 1942 would be at least 20 per cent larger than in 1941. No such increase seems probable or even possible. Both production and transportation were increased more in 1941 than in any previous year; they would have to be increased much more in 1942 than in 1941 to realize Mr. May's estimate; and, of course, the more they have been increased already the more difficult it becomes further to increase them.

There is at the beginning of 1942 a situation confronting the railways which was entirely unexpected and for which no provision has been made. Virtually all the rubber used in this country emanates from the Orient, and the prospective supply from that source has been extinguished by war in the Pacific. Consequently, the government has restricted the sale of tires for motor vehicles to those used for defense and the most essential civilian purposes. This apparently means within a few months a very great reduction in the use of private automobiles, and, finally, if the war lasts as long as expected, a virtual discontinuance of it. That,

in turn, means the diversion of an immense volume of both short and long distance business to street cars, railways and other means of transportation not using tires.

Shortage of Rubber Threatens Huge Increase in Passenger Business

How are the railways going to meet the probable increased demand for passenger transportation? During the last war period their passenger business increased from 35 billion passenger-miles in 1916 to 43 billion in 1918, and continued increasing afterward to 47 billion in 1920—the increase in 1918 over 1916 being 23 per cent and in 1920 over 1916 being 34 per cent. This caused increases from 15½ passengers per car in 1916 to about 20 in 1918 and 1920, and from 59 passengers per train in 1916 to 79½ in 1918 and 82½ in 1920. The largest increases occurred on trains between large centers of population, with the result that they became overcrowded and it became difficult to get space on them without long previous reservations. Because of increased use of buses and automobiles, especially the latter, railway passenger business steadily declined from 1920 to 1929, and then took a nosedive during the depression, with the result that in 1933 it was only 16⅓ billion passenger-miles—but one-third as large as in 1920. Meantime, the number of passenger-train cars, after increasing to a maximum of 54,773 in 1926, steadily declined to 46,510 in 1933.

Although from 1933 to 1940 railway passenger business increased from 16⅓ billion to 24 billion passenger-miles, or 45 per cent, the number of passenger cars declined further to 37,817 at the end of 1940. Then in 1941, partly owing to troop movements, passenger business increased to about 29 billion passenger-miles, or 22 per cent over 1940 and 78 per cent over 1933. This made it almost as large as in 1929, although at the beginning of 1941 there were 28 per cent, or 14,442, fewer cars than in 1929. And while 548 were ordered last year, only 229 were built, passenger cars being far down on the government's priority list for materials.

Because of the tire shortage the railways may during this war have made upon them a much larger demand for passenger transportation than ever before; but, as passenger cars cannot be built over night, it is a certainty that they cannot meet any such demand.

Railway Service and Earnings in 1942

No doubt the general use of automobiles will be continued for months; but, even before tires begin wearing out, it will be reduced, thereby increasing the demand for railway service; as tires do wear out, the demand for railway service will correspondingly increase; and probably it will finally become necessary to restrict travel by rail excepting for essential purposes. Meantime, government priority authorities should afford the railways and car builders full opportunity to get materials for passenger cars; for apparently all existing cars will have to be kept in good condition and an increased number built if travel even for essential business purposes is not to be severely restricted.

The Association of American Railroads has based its equipment program on an estimated increase of 10 per cent in freight traffic in 1942; and this seems more reasonable than OPM's estimate of a 30 per cent increase in the country's total production. In trying to estimate future railway gross and net earnings there must be considered the probable increase in passenger as well as freight traffic, the pending application for advances in rates due to the advances in wages recently made, other prospective increases in expenses and prospective increases in taxes. In an article elsewhere in this issue we have tried, without very satisfactory results, to estimate increases in gross earnings, operating expenses and net operating income next year. If there should be an increase of 10 per cent in all traffic, and the Interstate Commerce Commission should grant about the advances in rates being sought, gross earnings in 1942 probably would be approximately 6 billion dollars, and, allowing for increases in wages, other operating expenses and taxes, net operating income probably would be approximately 1 billion, or about the same as in 1941.

Must Keep Production and Transportation in Balance

It will not be easy for the railways to meet the freight traffic demands of 1942 if they increase more than 10 per cent; and perhaps more difficult before the end of the year to meet passenger demands. They still have surplus freight-carrying capacity; but like any other industry, the more their surplus capacity already has been used up the more difficult it becomes to utilize what is left, and the more necessary it becomes to expand.

However, we predict that the railways will make relatively as good a record in meeting demands for freight service in 1942 as they made in 1941. Many producing industries already are working to capacity; it will be no easier for them to increase capacity than for the railways; and, therefore, the increased demands that they will make on the railways can easily be overestimated. As Ralph Budd has wisely said, the country's production and freight transportation are now in balance; and all that is needed to keep them in balance is to afford equal opportunity for expansion to production and transportation. The railways are a primary defense industry; and there is no possible way of affording other industries opportunity to contribute their utmost toward providing for the nation's civilian and war needs that does not include concurrently affording the railways similar and equal opportunity.

Bachrach

Joseph B. Eastman

Director, Office of Defense Transportation

A Message from Mr. Eastman

"The railroads during the past year have served the nation well. In this, of course, they were greatly assisted — perhaps to a degree which sometimes seemed superfluous to them — by other agencies of transportation. They were aided equally by the shippers and receivers of freight; and to me it is one of the most encouraging aspects of our very real and immediate transportation problem, that the railroads and their patrons are working so harmoniously together for their own, and for their country's, benefit.

"We should, however, I fear, be very much misled, if we were to assume that the superior service the railroads have so far given in this crisis will continue without considerably more difficulty than has so far been experienced. The shortage of essential materials has delayed the production of rolling stock, estimated as needed to move 1942's prospective traffic; and, since those estimates were made, America has become an active belligerent, with what eventual effect on future traffic it would probably now be possible only to guess.

"To find out as well as may be in advance what these traffic requirements are going to be, and also where and when, and then to take the proper requisite steps to prepare in advance to meet them, is, of course, the primary function which the Office of Defense Transportation was established to serve. The other duties of the Office, as set forth in the Executive order which created it, are largely a definition of the means which may be employed in attaining the central objective. With this objective I am sure that all railroad men, and all other transportation and traffic men as well, are in entire sympathy, and that they will accord the Director and his staff the co-operation without which they cannot discharge their responsibilities.

"The path ahead of us will not be easy. We cannot be sure of many things which lie ahead, but we certainly can of this. The remarkable accomplishments of 1941 will have to be surpassed — perhaps under conditions much less favorable to the attainment of records than 1941 has been. But by working together the job, whatever it develops into, will be done, and done well. In that I have every confidence."

Ralph Budd

Transportation Developments and Prospects

By Ralph Budd

President of the Burlington Lines and Formerly Transportation Commissioner, The Advisory Commission to the Council on National Defense*

ALTHOUGH it was well in advance of the treacherous attack upon our country on December 7, 1941, that the government doctrine of "business as usual" had given way to its program of "armaments before everything," the developments of the last few weeks have emphasized the vital role which our transportation facilities are destined to play in the titanic struggle in which we are now engaged. The answer to the fundamental question of the adequacy of our transportation facilities need no longer be based upon theory or the serious bottlenecks which developed through inefficient utilization and lack of control during the period of the first world war. The records of American transportation during the interval since the outbreak of hostilities in Europe on September 1, 1939, are conclusive evidence as to the ability of the carriers to meet the nation's requirements, if certain known conditions are complied with.

Production and Transport Now in Balance

The events of the last 12 months have developed the fact that there exists a favorable balance between national production and transportation. Just as much raw material was being moved as could be obtained, with the exception of some agricultural products. There were no limiting factors in conjunction with productivity, except the capacity of the manufacturing plants. Moreover, there was a slight surplus of transportation which can be maintained in the face of increasing traffic, provided that transportation is considered as an integral part of our national production and that due provisions are made to maintain that relationship and that favorable balance. Such a course presupposes the judicious use of transportation facilities to the end that both motive power and cars will perform their maximum service.

The primary requisite in this respect is the assurance of an adequate supply of all materials necessary to provide for the building of new equipment as well as the adequate maintenance of all equipment and all the facilities of the transportation plant. This, together with the close cooperation which now exists between the carriers and the users, especially the Army and the Navy, and the shippers advisory boards, will assure an ample supply of transportation to meet the added requirements of a shooting war, provided that traffic is handled in an orderly manner at all times.

It was not until recently that such a definite statement could be made, for the reason that heretofore there was no way of determining how much transportation might be required with our manufacturing plants operating at capacity. However, during the last year they have attained that objective, and while increased production is a certainty in future months, it will be accomplished through the enlargement of plants and by reason of greater production from the farms.

Since the country has witnessed three annual traffic peak periods without any delay to defense work—October, 1939, when weekly car loadings reached a maximum of 856,289; October, 1940, with a peak in weekly loadings of 837,651 cars and finally a week in October, 1941, when loadings reached a peak of 922,822 cars—we can say with confidence that our transportation resources at this time are sufficient fully to meet our needs. Moreover we can affirm that if transportation is treated as an integral part of our war effort and if it is expanded accordingly, these resources can be depended upon to meet all requirements.

On the other hand, if this policy is not followed in its entirety, there is no basis for guaranteeing the continuity of satisfactory service. With the successful handling of last autumn's peak traffic, all speculation as to the adequacy of transportation has given way to certainty of this fact. In the greater war emergency, it is of paramount importance that that balance shall be maintained, for the success of our armed forces depends almost completely upon the efficiency of our transportation.

In preparing for the increase in traffic, the most important index by which we can gauge the future requirements of the country is the prospective increase in steel production. It is now estimated that steel production for 1942 will exceed that of 1941 by 2,500,000 tons and that the production for 1943 will be stepped up by 10,000,000 tons more than for 1941. American transportation must be prepared to meet these requirements promptly and without hesitation.

Adequate Control for Export Traffic

Apart from the need for ample capacity in transportation, the most important contingency now is the adequate regulation of the movement of export traffic through our ports. There are at least twelve different government agencies now engaged in this traffic and the situation may be likened to the rush of a crowd out of a single door, where, if hysteria instead of orderliness prevails, serious congestion is bound to result.

Although the fact is not generally known, the railways have already used embargo lists as a means of promoting a smoother flow of traffic. These embargoes have been employed in instances where strikes have made it impossible to unload cars, and in other instances where various conditions have interfered with the prompt loading and unloading of equipment. While the railways have unquestioned authority in applying embargoes to commercial freight, some doubt has arisen as to whether such embargoes may be applied to the Army and Navy.

The failure of transportation during the first world

* This article was prepared by Mr. Budd before his retirement as transportation commissioner on December 31. Chairman Joseph B. Eastman of the Interstate Commerce Commission on January 1 by appointment of President Roosevelt became director of all domestic transportation for the government and Mr. Budd has returned to the Burlington.

war is attributable directly to the use of cars for warehouse purposes and not to scarcity of equipment. That failure was brought about by the indiscriminate use of the priority system as applied to transportation. In the present emergency, the continued use of embargoes presents decided advantages over the priority system. The procedure is much simpler in that the embargo plan will apply to a small proportion of traffic only, for, instead of designating the freight which may be moved, involving huge quantities under the priority system, embargoes are applied to such materials that cannot be moved at the time and which represent only a small part of the total.

A Problem of Intensive Expansion

The transportation problem of the moment is one of intensive rather than extensive expansion. The mileage of our railways, highways, waterways and airways, if properly maintained, is adequate to handle a considerably larger volume than the present traffic. All indices, however, point to the fact that present equipment, in some instances at least, is being utilized to an extent which closely approaches its capacity. Therefore, new and additional units must be provided if the increased traffic of war and lend-lease commitments is to be handled promptly and efficiently. It is imperative that materials needed for the building of such equipment and facilities be made available in a continuous and uninterrupted flow.

In order to obtain a full understanding of the American transportation system, its accomplishments and its relation to the problems which now confront the nation, let us consider the physical resources of that system. Five different agencies, our railways, inland waterways, pipelines, highways and airways, comprise the greatest transportation system in the world,—a system with a plant unequalled in extent as well as in the efficiency of its services.

Since the railways still handle nearly two-thirds of the nation's total freight traffic and since, during the first world war, the railway plant became clogged and service was unsatisfactory, it is natural that now the spotlight of attention is focused upon the adequacy of railway service. It was with the European rumblings which prefaced events to come, that in the early spring of 1939 the railways began building up the capacity of their plants. A large-scale program for the repair of equipment was undertaken to prepare for the peak movement of freight in the autumn of 1939. This program proved ample for the tremendous increase in traffic which followed the beginning of hostilities in Europe on September 1, 1939. Immediately thereafter the railways began their preparations for the seasonal peak of 1940, by the continuation of the car repair program as well as by a substantial increase in orders for new cars.

Constant Study of Demands

Following the establishment of the Transportation Division of the National Defense Advisory Commission in the spring of 1940, as an agency for bringing about cooperation and unification of effort, my office has been engaged in a constant study of actual and prospective demand for railway transportation and has made recommendations as to the equipment necessary to meet those requirements. In July, 1940, I recommended that the ownership of railway freight cars be increased from 1,648,696 to 1,700,000 units as soon as practicable. Moreover, a drive was started to reduce the proportion of bad order units from 9 per cent to 6 per cent. As a result of those preparations the peak movement in the autumn of 1940 was carried successfully.

Based upon estimates prepared (and periodically revised upward to keep pace with the enlarged defense program) by the Bureau of Research and Statistics of the Advisory Commission, the Bureau of Railway Economics, the shippers regional advisory boards and others, the railways not only continued but also expanded their car programs during the year 1941. Those preparations again proved adequate in meeting the seasonal peak movement last fall, even though the deliveries of new cars as of October 1, 1941, fell short of the 1,700,000 total by 24,370 units. This deficiency in the building of new cars was due entirely to the inability of the builders to secure materials. As further evidence of the effectiveness of concerted action on the part of the railways to increase the availability of their equipment, the ratio of bad order cars has been steadily reduced until it reached the lowest point on record, 4.1 per cent as of November 1, 1941, while unfilled orders for new cars aggregated 80,504 units as of the same date.

As an additional illustration of the determination to increase the number of serviceable cars, an effort has been made to secure additional service from older equipment whose retirement and scrapping is predicated upon limited expenditures based upon the age of the equipment. By increasing expenditures for the rehabilitation of older units, the service life of these cars is being extended appreciably. As a direct result of this policy the dismantling of equipment in this classification has been reduced from 75,000 or 80,000 to 30,000 cars per year, thus resulting in a net increase of 45,000 to 50,000 serviceable cars per year by this action alone.

What Equipment Requirements for 1942?

On October 1, 1941, there were 1.675,630 railway-owned freight cars in operation, or 24,300 units short of the accepted program as of that date. In view of the greatly expanded armament programs, it is my opinion that 1,800,000 units comprise the minimum necessary to meet the requirements of 1942. The proportion of bad order cars now approaches an irreducilbe minimum, the dismantling of old equipment must of necessity involve 25,000 or 30,000 cars per year and while more cars were built during last October than in any month since 1929, that total of 6,029 units represents an average monthly production of less than half our actual requirements. Moreover, with a serious lag in production during the last two months of 1941, due to the shortage of materials, it is imperative that that condition should be remedied at once. In order to expand the ownership of freight cars to meet the minimum goal and to provide replacements for dismantled equipment, the building program for the 12 months ending October 1, 1942, must provide a minimum of 150,000 new cars to meet the ever-increasing traffic demand.

The situation with respect to motive power closely approximates that of freight cars. The ratio of bad order locomotives also has been reduced substantially during the period from June 1, 1939 to November 1, 1941. During that same period, 331 new steam locomotives and 805 new electric and Diesel locomotives were placed in service. On the latter date there were on order 284 steam and 327 electric and Diesel locomotives. Here again is a situation which requires close coordination with our war effort, for increased motive power is essential. The prompt supply of all necessary materials for these locomotives is fully as important as the requisites for building the machines of war and immediate action should be forthcoming to assure the building of 1,000 new units of motive power during 1942.

The increasing volume of troop movements for

maneuvers and other government purposes, together with the fact that there are no priorities covering materials for passenger equipment, may lead to some stringency in travel. The railways have been urged to increase their supply of extra passenger cars by discontinuing some passenger service. As Transportation Commissioner, during the last year I addressed a letter to all of the State Public Utilities Commissions outlining the necessity for this program and their response has been helpful. In many instances arrangements have been made to discontinue passenger trains where this can be done without much inconvenience to the public.

An Integral Part of Our War Machine

An inventory of our railways now shows that they are capable of handling the present volume of traffic. For more than two and one-half years they have carried an ever-increasing volume and they have met that test by employing a three-fold program, (1) by reducing the number of bad order units of equipment; (2) by purchasing new units of equipment, and (3) by increasing the efficiency of their operations. With "bad order" ratios approaching an irreducible minimum and with the rail carriers operating near the peak of efficiency, it is evident that any expansion of equipment capacity depends entirely upon the prompt delivery of new units.

With current deliveries of new equipment falling considerably behind schedule because of the shortage of materials and with that lag becoming more pronounced, there may be a serious tightening in the car supply this year. Moreover, it must be remembered that after a prolonged period of restricted maintenance, the fixed properties as well as the rolling stock have been called upon to handle a sharply increased load for more than two and one-half years. Government agencies, which in estimating the material requirements of the railways for 1942 and 1943 have been prone to base these requirements upon requisitions for previous years without due consideration for the greater factor of traffic, ignore the necessity of increased material requirements for handling more traffic.

While it is true that the railways have in a narrower sense done their best with what they have, the broader problem of doing the best with what we as a nation have at our disposal, is one of ultimate policy. A vital part of that policy is the consideration of our railways as an integral part of our war effort. The importance of allocating enough material to maintain railway plants and equipment in good condition and to make such enlargements as are necessary for handling the increasing traffic, should not be underestimated. In addition to the requirements for locomotives and cars, the maintenance of bridges and structures, signals and all plant facilities should be carefully planned to meet the emergency. For instance, as the result of detailed investigations and in view of the extraordinarily heavy traffic of the last two and one-half years, I am convinced that a minimum rail renewal program of 1,500,000 tons should be undertaken during 1942.

Our system of inland waterways, including the Great Lakes which account for 80 per cent of the total waterway traffic, comprises the second-ranking intercity freight carrier. An all-time record of approximately 140 billion ton-miles of freight, an increase of 110 per cent more than in 1938, were carried over the routes of our inland waterways during 1941. Freight cargoes on the Great Lakes increased from 49 billion ton-miles in 1938 to 115 billion ton-miles in 1941, while the corresponding increase in traffic on rivers, canals and connecting channels rose from 18 billion ton-miles to approximately 25 billion ton-miles during the same period.

While a tremendous volume of such strategic commodities as iron ore and coal have ordinarily moved over the Great Lakes, our war effort has required the movement of an even greater volume of iron ore than at any time in our history. By the end of the season 80,116,360 long tons had been brought down from the mines, as compared with the previous year's record of 65,204,600 tons. By reason of the prime importance of keeping blast furnaces supplied, every effort has been made to facilitate the handling and transporting of iron ore; new legislation provides for the use of Canadian boats in lake service between United States ports; the carrying of heavier cargoes has been encouraged through the relaxation of load limits; and the building of 20 or more new boats has already been authorized. The entire cargo fleet has been operating at capacity and ice-breaking service was inaugurated to provide an earlier opening in the spring as well as to prolong the shipping season in the fall.

The pipelines of our country now comprise 103,500 miles of trunk and gathering pipelines for the movement of crude and refined petroleum, as well as approximately 100,000 miles of pipelines for carrying natural gas. During 1941 petroleum pipelines also established an all-time record, carrying a total of 79 billion ton-miles, representing an increase of 22.5 per cent over 1938. In providing for an expansion of this service, 2,500 miles of new pipelines were laid during the last year.

Our Highways and Airways

Although occasional shortages of for-hire trucks have been reported, this situation is not regarded as serious since it has not impeded armament production. In addition to the 600,000 for-hire trucks in the country, there are some 4,400,000 others and it would seem that no great hardship will result if the number of smaller vehicles, within this classification, were not substantially increased. The further expansion of truck operations in general for 1942 is being cared for by a program which will provide more than 1,000,000 new units to replace worn-out trucks, as well as an adequate supply of new parts to keep existing trucks in repair. During 1941 for-hire and private trucks engaged in inter-city service handled approximately 60 billion ton-miles of freight, an increase of about 62 per cent over 1938 and an all-time high for these carriers.

The most critical shortage which developed during the last year in commercial transportation lies in the bus and street car field. The need for additional transportation of this type is particularly acute in many localities where large munitions and armament plants have been established and where populations have increased manyfold almost overnight. By reason of a shortage of aluminum, buses had to be redesigned and as a consequence deliveries were severely restricted during the early part of 1941. The use of that exceptional period by government agencies as a basis for determining allocations of new units for 1941 and 1942 is bound to result in additional complications. However, efforts are being continued to alleviate this situation, in order to provide additional buses and street cars to handle the ever-increasing number of munition workers as well as passenger traffic, to and from training camps. It is also essential that a full complement of repair parts shall be made available promptly to keep the present units in continuous operation, and this matter also is being handled to that purpose.

The commercial airlines of the country again established another record in 1941 for the transportation of passengers and express, with approximately 4,100,000

(*Continued on page 17*)

What Will Earnings Be in '42?

Traffic can be predicted within rather narrow limits, but size of net hinges largely on outcome of rate case

By J. G. Lyne
Assistant to Editor

THE forecasting of the probable volume of freight traffic for 1942 involves fewer uncertainties than it has for many years. That is to say, in every year since the last war the nation has had surplus plant capacity; and, usually, a surplus of labor as well. There was no shortage of important raw materials. The *potential* increase in production and traffic, which the prognosticator had to take into account, was very large. Likewise, it was conceivable that production and traffic *might* turn downward. This year, with the nation's involvement in war, the forecaster does not have to consider a possible decline in production and traffic (barring possible military attack on the nation's productive facilities). At the same time, the forecaster also knows that the nation's productive capacity and labor force are nearing full utilization. Such full utilization sets a "ceiling" on production—and the present level of traffic and production constitutes the "floor."

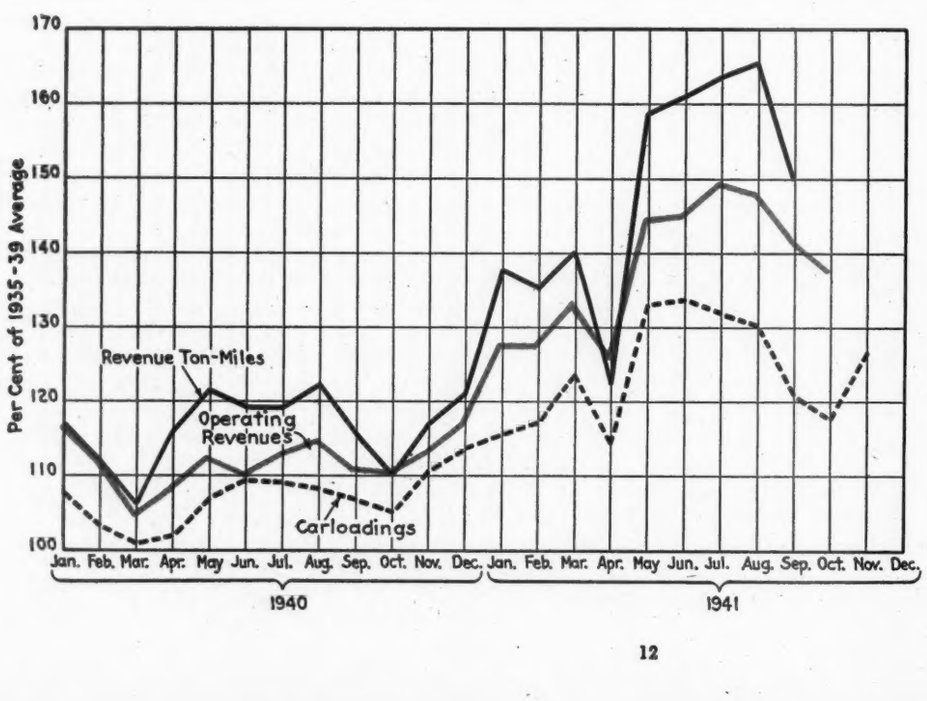
Will the 40-Hour Week Persist?

It may very well be, of course, that the "ceiling" is a somewhat flexible canopy. It will remain at one elevation, if the 40-hour week is retained and innumerable "featherbed" practices continue (not only in transportation, but in other industries as well). It would rise to a much higher level if these limiting factors were removed. As yet, however, there is no indication that these limitations are going to be eased in the early future—so a forecast for 1942 can ignore that possibility. Production in 1942 can, therefore, be expected to increase only as the small remainder of unemployment vanishes more completely and as labor heretofore "unproductive" (in the sense that its products are not tangible) is shifted to making goods which will fill freight cars.

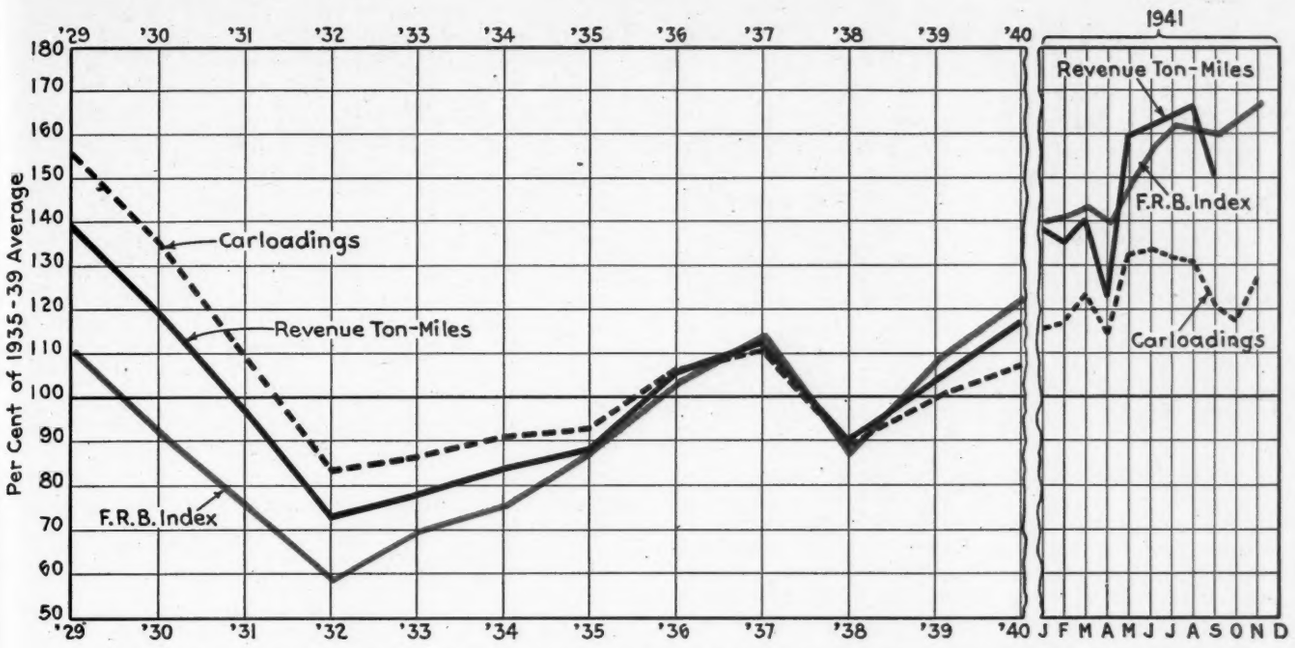
What Changes Will War Bring?

Up until the time that this country became actively involved in the war, most observers were of the opinion that 1942 production and railroad traffic would average about 10 per cent higher than that of 1941. Our participation in the war may justify "stepping-up" this estimate somewhat. On the other hand, there are factors in our participation in hostilities which will tend to offset the greater earnestness with which production will be pursued. Foremost among these, obviously, is the withdrawal of several additional millions of vigorous men from industry, for the enlargement of our military forces. Their places will be filled—but probably not so efficiently. Plant producing war materials will be operated more intensively, but such increase in production as results therefrom may easily be counterbalanced by reduced production of peace-time goods. All in all, as far as railroad tonnage is concerned, it seems doubtful whether the 10 per cent increase in traffic in 1942 over 1941, foreseen before we entered the war, will need to be very much increased.

The Federal Reserve Board index of industrial production (with the 1935-39 average taken as 100 per cent) had an average level of about 155 for the entire year 1941. In 1940 its average level was 122, indicating that production in 1941 (as this index records it) was 27



Operating Revenues Are Rising Higher Than Loadings, But Not as High as Ton-Miles


1941
Per Cent of 1935-39 Average
Carloadings
Revenue Ton-Miles
F.R.B. Index
Revenue Ton-Miles
F.R.B. Index
Carloadings
'29 '30 '31 '32 '33 '34 '35 '36 '37 '38 '39 '40
J F M A M J J A S O N D

Curiously Enough, Ton-Miles Appear Recently to Follow the F. R. B. Index Closely, While Loadings Trail Far Behind

per cent more than that of 1940. But the increase in carloadings in 1941 over 1940 was only about 16.5 per cent. Similarly, the increase in the F. R. B. index from 1939 to 1940 was 13 per cent, while the increase in carloadings was only a little more than 7 per cent. For some reason not immediately apparent, revenue ton-miles handled by the railroads follow the course of the F. R. B. index much more closely than do carloadings. For example, revenue ton-miles in 1940 showed almost exactly the same percentage increase over 1939 as the F. R. B. index did; and again in 1941, the increase in revenue ton-miles in the first nine months of the year was just about the same as the percentage increase in the F. R. B. index. This tendency of the upward trend in carloadings to lag far behind the F. R. B. index, while revenue ton-miles follow the index rather closely, is set forth graphically in the above chart.

Revenue and Capacity Estimates Differ

It would certainly be a grave mistake for the railroads —from a standpoint of physical capacity—not to prepare themselves (if the priorities authorities will permit) to move at least 10 per cent more carloads in 1942 than they were called upon to move in 1941. On the other hand, in forecasting probable railroad revenues, it would undoubtedly be safer and more in keeping with recent past performance to translate the prospective increase in the F. R. B. index into revenue ton-miles, at the same percentage, than into carloadings, in which the percentage increase may be only half as large.

In our Annual Statistical Issue, a year ago, in this space, we recorded the opinion of one of the country's foremost industrial economists that the F. R. B. index in 1941 would probably reach a temporary "ceiling" at about 140, and that it would not likely average much over 135 for the entire year. As a matter of fact, it actually averaged 155 for the entire year and reached a peak of 167. That this man's estimate was too conservative reflects no discredit upon him—especially when it is compared with the highly-publicized fantasies of some of the governmental "experts" who thought the railroads were going to be called upon to move upwards of 1,300,000 carloads weekly during the 1941 fall peak.

There isn't any use of paying any attention at all to "experts" who have no practical knowledge in the field where they claim to be experts; but, in such times as these, it is also true that even those best informed may likewise not hit the bull's eye entirely. It seems scarcely conceivable that the F. R. B. index should not advance at least 10 per cent on the average in 1942 over the 1941 average (about 155). If it advances no more than that, then railroad carloadings in 1942 should reach a total of about 44,500,000 for the year. This is rock bottom. Unless the war should end during the year, it is hardly possible that carloadings can go below this figure. If, on the other hand, which seems not improbable, carloadings—and not just ton-miles—increase 10 per cent in 1942 over 1941, then they will mount to about 46,600,000. The higher figure is what the railroads need to prepare for as far as capacity is concerned. The lower (44.5 millions) is what they may rely on, from a standpoint of revenue.

There remains to be determined how much revenue —gross and net—these prospective loadings are likely to produce. And here we get into intangibles, the greatest of which is: How large a rate increase will the Interstate Commerce Commission allow, and how soon will it be made effective? The logical method of approaching this question appears to be, first, to ascertain about how much gross and net revenue 44,500,000 carloads would produce without either a wage increase or a rate increase; next, to calculate what the result would be with the wage increase, but with no rate increase; and then, finally, to allow both for the wage increase and for a rate increase of the ratio requested by the railroads. The same calculation may then be repeated for the (apparent) maximum loadings total of 46,600,000. The chart on the opposite page shows the relationship which has obtained in 1940 and 1941 between the trends in carloadings and revenue ton-miles, on the one hand, and operating revenues, on the other.

A Minimum of 44.5 Million Loads?

During the 12 months ended with October, 1941, the railroads handled 41,420,000 carloads of freight. Their gross revenues were $5,167,000,000 and their net railway

operating income was $997,000,000. The 44,500,000 carloads—which it seems is the minimum which the railroads can reasonably expect in 1942—would represent an increase of 7.5 per cent over the loadings for the 12 months ended with October, 1941. Loadings of 46.6 millions would represent a 12.5 per cent increase. The railroads in the 12 months ended October, 1941, realized $124.70 in gross revenue for each car handled (passenger and other revenues are also included in this figure—but since the trend of these revenues is roughly comparable to that in freight revenue, it does not appear necessary to separate them for purposes of rough estimates). In 1940, operating revenues per car loaded averaged $118.20. The tendency of average revenue per car appears thus to be upward, because of the increased load per car and the lengthening average haul.

A Billion—Except for the Wage Increase

Cars loaded in 1942, therefore, ought to bring in—without rate increases—at least the $124.70 average attained in the 12 months ended October, 1941. A loadings total of 44.5 million cars, therefore, should produce about $5,500,000,000 of operating revenue, without any increase in rates. In the 12 months ended October, 1942, operating expenses, taxes and joint facility rentals totaled $4,171,000,000. Because of the increase in the cost of materials and because of the necessity for more intensive maintenance, it is scarcely likely that the railroads could now handle an increase of 7.5 per cent in traffic without at least a proportionate increase in operating expenses—even without a wage increase. The increase in taxes and joint facility rents would, probably, also be at least proportional to the increase in traffic. So—leaving out of account any wage or rate increases—the railroads might have counted in 1942 on gross revenues of $5,500,000,000; expenses (including taxes and joint facility rents) totaling $4,484,000,000; and net railway operating income of $1,066,000,000—which would be about 70 millions more than was earned in the 12 months ended with October, 1941.

In the above, 1942 operating expenses have been calculated at an increase of 262 million dollars over the 12 months ended October, 1941, merely on a basis of increased traffic. The railroads estimate the annual cost of the wage increase to them at 332 million dollars on the basis of 1941 employment. With larger employment in prospect to handle 1942 traffic, the actual cost of the wage increase will probably be nearer 357 million dollars (i. e., 107.5 per cent of 332 millions) than the estimated 332 millions. All this increase would come out of net railway operating income, reducing it from a prospective 1,066 millions to 709 millions. In addition, the railroads expect that they will have to expend $30,000,000 for war-time protection of their property—which would further reduce net railway operating income to 679 millions. Even this figure is probably too high, because it takes but small account of the rising costs of materials and fuel. Such higher costs might trim the prospective net railway operating income to 600 million dollars, or even less than that.

600 Millions to a Billion

But 600 million dollars would represent a return of only about 2.3 per cent on the capital investment, and 700 million dollars would constitute less than a 2.7 per cent return. It is inconceivable that the Interstate Commerce Commission should consider such a rate as adequate in a period of maximum traffic. The rate increase the railroads have asked for is calculated to yield $357,000,000 on the basis of 1941 traffic. With prospective increased traffic, it should yield more than that. If granted in full, it probably would just about offset the increased expenses so far foreseeable. But, in any event, even with the rate increase in full, at the *minimum traffic prospects* for 1942, it seems doubtful that the carriers can look forward to net operating income any higher than that which they earned in 1941.

But what if loadings should reach 46.6 millions? Such traffic would probably yield $5,811,000,000 of operating revenues, without a rate increase—or 644 millions more than the operating revenues for the 12 months ended October, 1941. But such an increase in traffic would, as things now stand and without any account of the wage increase, probably entail a proportionate increase (i. e., 12.5 per cent) in expenses and taxes—which would total 521 millions. In other words, without any wage increase or without any rate increase, 46.6 million carloads might be expected to increase net railway operating income by 123 millions (i.e., 644—521) over the 997 millions earned in the 12 months ended October, 1940— thus giving a total of 1,120 millions.

This, of course, is an entirely theoretical figure—because there *is* a wage increase to account for. If it be assumed that a proportionate increase in employees would be necessary to move this increased traffic (and something like a proportionate increase *might* be more likely to occur now that desirable labor is becoming scarcer, and older cars and locomotives are being continued in service beyond their normal service expectancy) then the increased wage bill in 1942 would be 112.5 per cent of the 332 millions the railroads calculated on the 1941 basis, or 372 million dollars. This, added to the $30,000,000 which the carriers expect to have to expend for property protection, would mean a deduction of 402 millions from the 1,120 million of net railway operating income which the carriers might, except for the wage increase, have expected to earn (at a maximum) in 1942. Thus, the prospective net railway operating income would be reduced to 718 million dollars, unless a rate increase were granted; and this 718 millions seems rather optimistic, too, because—while it may slightly overestimate the wage bill, it allows next to nothing for increasing cost of materials.

Much Depends on the Rate Case

The rate increases which the railroads have requested, if granted in their entirety, would probably largely offset the wage increases, restoring net railway operating income to somewhere in the neighborhood of 1,100 millions. This last-mentioned figure would seem to be about the peak which the railroads may expect to earn. It is not generous—only about 4¼ per cent on the capital investment—but it is more than the railroads have earned in any year since 1929.

In sum, we are inclined to believe that 1942 traffic prospects lie within relatively norrow limits, bounded on the bottom by 44.5 million carloads and on the top by about 46.6 millions. But net railway operating income cannot be prognosticated with any certainty, because it so largely depends upon the character and speed of the action of the Interstate Commerce Commission in dealing with the rate increase application. With rapidly rising costs of materials and niggardly and dilatory action by the Commission, net railway operating income might conceivably drop to 700 millions or even lower. With prompt and generous action, on the other hand, 1942 net operating income might be as high as, or even slightly higher than, that of 1941.

Wage Increase More Than Owners' 9-Months' Income on Some Roads

Rough approximation of wage increase cost to 47 large carriers, shows it exceeds nine months' net income of 26

THE Bureau of Railway Economics has estimated that the wage increase, recently exacted from the railroads by the unions, will cost the carriers $331,771,000 annually *"on the basis of 1941 employment levels."* The italicized qualification is important, because, of course, it is quite unlikely that the employment pattern of 1942 or any subsequent year will follow 1941 exactly. With the nation involved in the most dangerous war in which it has ever been engaged, the first question which must be asked of this wage increase (as of all important railroad developments) is: *What effect will it have on the railroads' ability to do their part in fighting the war?*

The railroads have so far, as everybody knows, done a most satisfactory job in meeting the exacting transportation requirements of the military authorities, and they have done so while giving flawless service, not only to all traffic directly or indirectly related to the production of defense goods, but to ordinary civilian traffic as well. The continuance of such service requires undiminished maintenance of railroad plant, and also adequate cash and credit with which to purchase additional rolling stock and to make such improvements to fixed plant as are needed for the efficient movement of the largest traffic in history. This war has been accurately described as one of industrial production—and the efficiency of industrial production cannot exceed that of the "transmission belts" and "assembly lines" which bring parts together as finished products. The railroads are the "assembly lines" and the "transmission belts" of the nation's industry, as a whole.

Credit and Cash an Individual R. R. Problem

It is not possible to subtract a third of a billion dollars from railroad net earnings (which is the effect of the wage increase) without seriously depleting both the cash and credit which the carriers must have, if they are to purchase the materials and hire the labor necessary to continue their functioning at top capacity and at top efficiency and dependability. There is no such thing as "railroad credit" or "railroad cash" in any significant general sense. That is, it is not the state of "railroad credit" or "railroad cash" which enables the X. Y. & Z. Railroad to hire the help and buy the materials that it needs to uphold its high standards of service. Rather, it is the cash and the credit, or lack of them, of the X. Y. & Z. Railroad itself.

Credit and cash being necessities of the individual railroads—rather than of the industry considered as a whole—the effort has been made herein to estimate what the impact of the wage increase may be on individual properties. Accuracy is impossible in such an undertaking. Nevertheless, a qualified approximation of the division of the estimated $331,771,000 increase in railroad expenses, among the carriers of the class designated by the Interstate Commerce Commission as "large steam railroads," is set forth in the accompanying table. This tabulation will be misleading unless its limitations and the method of its compilation are taken into account.

The Method Used in Estimating

In this "rule-of-thumb" allocation to individual carriers of the aggregate estimated cost of the wage increase, the assumption has been made that the increase will be shared by the various companies *in the same ratio as operating expenses in the first nine months of 1941 were divided among the same carriers.* That is to say, the operating expense of each of these large carriers for the nine months, 1941, was divided by $2,614,576,044 (the operating expense total of all Class I roads for the nine months) and the resulting percentage was used as a multiplier for $331,771,000 (the estimated aggregate cost of the wage increase). As a gage of the effect of the cost of the wage increase on the cash and credit position of each individual company, the nine months' net income of each carrier is shown in an adjoining column. It will be seen that, of the 47 carriers listed, 6 already had nine months' deficits in the net income account, even without any wage increase. Of the remaining 41 companies, the estimated cost of the wage increase would more than wipe out the nine months' net income of 20, leaving only 21 roads which would have had any net income for the first nine months of 1941, if the annual cost of the wage increase had been charged against it.

If, as this table demonstrates, the wage increase would serve to make more than half of the country's largest railroad systems profitless for nine months of the biggest year in freight traffic history, then its effect on the credit and cash position of specific railroads whose continued efficient service in the present crisis is essential to the national safety, is obvious. Half or more of the country's leading railroads cannot possibly secure the funds necessary to their continued satisfactory operation—unless the carriers are recompensed for the cost of the wage increase from some other source. There is no other available source except a rate increase. The long-run effects of such an increase, particularly on some classes of traffic, will doubtless be serious—once the present emergency passes and the flood of traffic is followed by a dearth. But "sufficient unto the day is the evil thereof," and inadequate revenue at a time of maximum traffic is the evil of the present day, for which no other remedy save a rate increase has been suggested—even by those who object to such an increase.

The basis followed in the accompanying table of allocating the prospective cost of the wage increase among individual roads may occasion some misgivings. Originally, in preparing this table, the aggregate increased wage cost was taken as $311,771,000 (which was the earlier figure used by the railroads, before they added $20,000,000 to the total to allow for adjustments in the

wages of employees not included in union schedules, to make them conform in compensation to scheduled jobs). Then, instead of using operating expenses for the first nine months as the basis of allocation, the figures for the latest available month, October, were used instead. Insofar as time would permit, the various large roads were contacted, to secure their criticisms of the proposed method of allocation.

Many helpful suggestions were received and the method of allocation finally employed was that which seemed best to conform to the preponderant opinion of those who kindly gave their advice. Right at the outset, the seemingly valid criticism was made of the method originally suggested that some of the carriers included provision for increased wage costs in their October operating expenses, while others did not—so that to divide the aggregate annual wage cost on the basis of October operating expenses would distort the road-to-road comparisons. The further criticism was made that the total of $311,771,000 neglected to include the $20,000,000 increased wages on non-scheduled jobs. These two criticisms seemed valid to us, and we adopted both of them. That is to say, we raised the total estimated cost of the wage increases to $331,771,000; and we adopted the nine months' operating expenses, instead of those for October, as the basis of allocation.

Even then, the estimated costs of the wage increases, as this table shows them, will not hold for any given year—unless it be by accident. If 1942 brings more traffic than 1941 did (and of course it will), then the added costs to the carriers will be greater than $331,771,000—because there will be more employees to enjoy the increase in 1942 than there were in 1941.

What After War Traffic Ceases?

When the war is over, if these wage increases are maintained, then the railroads will find many more trains, many more stations and many more branch lines unprofitable than would have sunk to such condition without this increase; and just that many more services will be pulled off, which otherwise might have been continued. Except in a time such as the abnormal present, when traffic presses upon available facilities, the railroads so control their total wage payments that they bear a constant relationship (averaging about 47 per cent) to gross revenues. The effect of inordinate wage increases, therefore, is shared—not alone by railway owners—but also by railway labor, in the loss of employment. The unions may insist that employees' services are worth a dollar or two an hour, but a considerable part of the shipping public will pay rates based upon such wages only at times when a transportation shortage exists.

When there is a surplus of transportation available, as there will undoubtedly be of unprecedented proportions when the war ends, the willingness of the shipping public to buy dollar-an-hour or two-dollar-an-hour transportation will diminish as a surplus of 50-cents-an-hour competing transportation arises. At that time the railroads, and also their employees, will suffer great hardship, if the present high basis of pay (and especially featherbed rules) is retained.

But this isn't the question now. The job now is to win the war. Railroad contribution to the war effort can be aided—indeed must be aided—by rate increases and, for the time being, in view of the shortage of other forms of transportation, the modest rate increases the railroads seek to this end can be made to "stick." That is to say, they will actually produce the revenue they ought to produce theoretically.

The long-run problem of what the future peace-time

Hypothetical Computation of How the Wage Increase, If It Had Been in Effect Throughout 1941, *Might* Have Compared with Nine Months' Net Income of Larger Roads

Roman Figures Are Our Uniform Computations—Those in Italics Are Derived by Various Methods Believed More Applicable to Specific Roads

	1941 Operating Expenses 9 Months	% of Total Class I Operating Expenses* 9 Months	Presumptive Increase in 1941 Expenses if Wage Increase Had Applied Throughout the Year†		Net Income in First Nine Months, 1941‡
Alton	10,732,706	.41	$1,360,000		97,820
			1,540,000		
A. T. & S. F. System	111,379,697	4.26	14,131,000		20,930,079
			11,840,390		
A. C. L.	33,677,128	1.29	4,279,000		7,505,392
B. & O.	114,670,147	4.39	14,562,000		17,891,207
B. & M.	28,750,458	1.10	3,649,000		5,366,805
			3,399,626		
C. of Ga.	11,557,622	.44	1,460,000		893,042
			1,261,000		
C. N. J.	22,919,455	.88	2,919,000		464,924
			3,111,000		
C. & O.	57,593,542	2.20	7,298,000		26,034,582
C. & E. I.	9,982,940	.38	1,261,000		1,171,263
			1,000,000		
C. & N. W.	57,626,671	2.20	7,298,000		2,588,575
			6,968,000		
C. B. & Q.	58,675,458	2.24	7,430,000		8,019,610
C. G. W.	10,320,318	.39	1,294,000		1,301,732
C. M. St. P. & P.	70,263,687	2.69	8,923,000		5,014,346
C. R. I. & P.	49,850,475	1.91	6,336,000		4,502,694
			6,300,000		
C. St. P. M. & O.	11,359,986	.43	1,426,000	d	548,211
			1,500,000		
D. & H.	16,184,715	.62	2,057,000		3,453,800
D. L. & W.	31,154,375	1.19	3,947,000		3,306,066
			3,600,000		
D. & R. G. W.	17,068,284	.65	2,156,000	d	2,817,808
E. J. & E.	12,014,961	.46	1,526,000		4,487,933
			1,538,000		
Erie	51,107,892	1.95	6,468,000		6,280,461
G. T. W.	15,356,191	.59	1,957,000		1,797,388
G. N.	54,853,422	2.10	6,966,000		12,733,086
			6,100,000		
G. M. & O.	11,491,098	.44	1,460,000		1,687,187
			1,700,000		
I. C. System	72,308,138	2.77	9,188,000		7,684,013
			10,000,000		
L. V.	27,464,238	1.05	3,483,000		3,070,625
			2,828,500		
L. I.	14,465,450	.55	1,824,000	d	529,939
L. & N.	56,033,327	2.14	7,099,000		12,937,490
M. St. P. & S. S. M.	18,860,195	.72	2,388,000	d	2,721,828
			2,055,067		
M-K-T Lines	18,252,179	.72	2,388,000	d	201,792
Mo. P.	54,930,042	2.10	6,966,000		2,702,798
N. Y. C.	233,953,462	8.95	29,688,000		21,824,343
N. K. P.	24,921,178	.95	3,151,000		7,220,171
N. Y. N. H. & H.	53,526,609	2.05	6,800,000		4,853,949
N. & W.	46,757,667	1.79	5,938,000		22,162,787
N. P.	41,838,177	1.60	5,307,000		4,784,882
P. R. R.	318,352,547	12.18	40,402,000		36,985,844
P. M.	20,566,409	.79	2,621,000		2,628,196
P. & L. E.	15,429,212	.59	1,957,000		4,355,893
Rdg.	38,125,123	1.46	4,843,000		7,258,402
			5,227,000		
St. L. S. F. Lines	32,214,891	1.23	4,080,000	d	429,283
S. S. W. Lines	12,252,891	.47	1,559,000		2,686,070
S. A. L.	34,634,290	1.32	4,379,000		1,001,910
			5,000,000		
So.	62,939,181	2.41	7,994,000		13,132,634
S. P. Lines (Excl. S. S.)	138,911,238	5.31	17,614,000		27,569,435
T. & P.	15,268,261	.58	1,924,000		2,221,088
U. P. System	114,701,063	4.39	14,562,000		14,010,249
Wab.	28,867,232	1.10	3,649,000		2,161,124
Total	$2,364,164,210	90.42	$299,967,000		$329,531,034

* Each road's 9 months' operating expense is divided by $2,614,576,044 (9 months' operating expenses of *all* Class I roads)—the result being the ratio of the individual carrier's expense to that of all Class I roads.

† The total estimated cost of the wage increase ($331,711,000) is prorated among the carriers, in the ratio which each road's operating expense, in the first nine months, bears to operating expenses of all Class I carriers in that period.

‡ Net income is set in juxtaposition to the estimated cost of the wage increase to indicate the effect that this increase would have on the equity holders—failing compensation from some other source. d—deficit.

NOTE: This table is not intended to provide financial analysts with a satisfactory basis for forecasting revenues of individual railroads. Several carriers suggest that the formula we have used gives results quite wide of the mark in their cases, pointing out that figures being required of the carriers by the I. C. C. will make accurate estimates possible about a month hence. At the same time, this approximation—inaccurate though it be in some individual cases—seems useful, at least to the extent that it makes clear the magnitude of this wage increase in relation to the return being received by railway owners. The individual estimates could be off 25 per cent, or even more, and still not vitiate the truth which this table evidences that *in many cases labor's share has been* INCREASED *by more than the owners' total receipts in three-quarters of the most prosperous year the owners have had in a decade.*

It has been pointed out that wages actually paid in 1941 would be a better basis for allocating costs of the wage increase than the method here used—which is true (especially because the ratio of wages to total operating expenses is higher on some roads than on others). Also of considerable importance is the fact that the ratio of the wage increase (especially of common labor) is higher in some areas than others.

course of rates ought to be can be studied at leisure; the job now is to get on with the war, even by methods of questionable long-run wisdom, if the necessities of the moment require their use, as they do now undeniably.

Even while the fire-fighters are putting out a conflagration in an essential part of his plant, the foresighted industrial executive makes his plans for reconstruction. The rate increase the railroads are now seeking is, frankly, nothing but an emergency device. There is no permanent solution to the problems of the railroads as self-financed private enterprise in constantly recurring emergencies which can be met only by rule-of-thumb percentage increases in rates. In normal competitive times, such increases are slow suicide—not only for the railroads as free enterprise, but also of the job-opportunities of railroad employees.

A realistic long-run program ought to take the place of such emergency action; and unless such a program is prepared and is ready to put into effect when transportation once more becomes highly competitive, the result will doubtless be most unfortunate for the railroad industry. The months, or years, during which the present war unfortunately will continue, give the carriers the opportunity to undertake the necessary study and to make the necessary preparations. As part of such a program, the more adequate education of railroad employees and their leaders in the effect of wage rates on jobs; and upon the necessity for a "subsistence wage" to capital for the preservation of employment, need to be included. The policy so-far followed by the railway unions is demonstrably destructive of their ultimate means of subsistence. What is "slow suicide" for the railroads is suicide also for their employees, and for the unions which these employees support with their dues and assessments.

A Formula for Capital-Labor-Shipper Harmony

The emergency fact-finding board in the recent wage dispute (while it was sitting as a court of justice, and not, umbrella in hand, as an agency to buy off union threats to the public safety at the lowest possible cost) put its stamp of approval on a formula which would protect railroad jobs, while assuring the highest possible wages consistent with job-protection. This formula would also protect railroad owners and customers equally with employees. It was stated as follows:

"Railroad earnings which are adequate to preserve the railroad mechanism in good health as a medium of transport may also be taken as earnings adequate to keep faith with existing investors and to preserve railroad employment as a long-run livelihood."

Here is a common ground upon which, with a modicum of enlightened self-interest, unions, patrons and owners ought to be able to meet, to their lasting mutual benefit.

Customers, owners and employees are the three partners who are needed to keep the railroads or any other enterprise going. If any one of these partners begins to withdraw, in large numbers, from the partnership, the action betokens eventual hard times for the other partners. For a long time now, the customer-partners have been deserting the railroads; and lately the owner-partners have been withholding participation. Railroads cannot be run by and for employees only—without customers and without capital. When that fact is learned, either by precept or experience, by the organized employees, they will doubtless temper their exactions to the degree necessary to retain capital and customers in the railroad business. To promote understanding of the fundamentals of this situation on the part of employees is a major responsibility of those railroad managements whose foresight tells them that, one day, the war will end—and with it the traffic which can be had without competing for it. But, meantime, the war has got to be won; and a rate increase to cover the rise in the cost of labor is necessary to enable the railroads to play their full part in helping Uncle Sam to do that job.

Transportation Developments and Prospects

(*Continued from page 11*)

passengers, 1½ billion passenger-miles and 5,200,000 ton-miles of express. Compared with 1938, these figures represent an increase of more than 200 per cent in the number of passengers and an increase of more than 170 per cent in passenger-miles, as well as an increase of about 140 per cent in air express.

The remarkable advances in the science of aeronautics and traveling by airplane constitute the outstanding phenomena of the developments in transportation since 1939. While it is recognized that the service requirements of the airway operating companies must give precedence to the requirements of our armed forces, nevertheless, it has been announced that commercial airlines will be allowed to add 228 new transport planes to their fleets during 1942, of which 112 already have been assigned to various operating companies.

In outlining the physical resources and the accomplishments of the nation's transportation during the period of our national preparedness program, I have attempted to present a concise review of a system which now comprises an integral part of our war effort. The several agencies within that system recognize full well the vital part which their services are destined to play and they can be depended upon to do their full share. Collectively, they have established as their goal the furnishing of efficient transportation when and where it is needed. Thus far that ambition has been realized.

With all proper pride in the very high standard of physical perfection and performance, it must be recognized that the transportation agencies alone could not have accomplished what was done in 1941. I do not know of any other business which is so dependent upon the cooperation of its patrons for its complete success. It is with a sense of real satisfaction that I acknowledge the close cooperation of the Army and the Navy, and of government contractors and suppliers in addition to the fine response from other shippers to an appeal for the prompt loading, unloading and release of cars and trucks.

There is, however, one phase of the program for the better utilization of equipment, in which neither the government nor any other shippers can participate in any way. The adequate maintenance of the transportation properties so that all agencies can render full and efficient service is a duty of the carriers themselves. In order that their equipment and their plants shall be expanded and maintained to meet every eventuality of war, it is of paramount importance that sufficient materials shall be made available to provide the essentials of transportation. By making the best possible use of the equipment which is available, we of the transportation group can hold those material requirements to a minimum. But that minimum we must have. With it, and the necessary additional units to keep transportation in step with the expanding productive capacity of our mines, our farms and our factories, we may rest assured of the adequacy of our transportation system.

Railway Supply

Molten Steel, Being Poured Into 32,000-lb. Ingot Molds, Starts on its Way to the Front

75 mm. Pack Howitzer and M-3 Tanks Flow From the Plants of the Railway Supply Industry

TOO much praise cannot be given the railway supply industry for the part it is taking in the nation's war efforts. In whirlwind fashion, old plants have been converted or restored, new plants built, machinery and tools secured from all sorts of places, special-purpose machinery and tools designed and built, expert workmen sought and found, and employees trained to unfamiliar tasks. As a result, volumes of war materials have already begun to flow from production lines. At the same time, these railway supply companies have stepped up their production of railway products greatly and have met the increased war requirements of the railroads to the extent that they have been able to secure the materials required therefor. All in all, it has been a spectacular performance.

To be specific, it is estimated that more than two billion dollars of prime and sub-contracts for war materials have already been placed with these supply companies since 1939 by the Quartermaster Corps, the Air Corps, the Navy and the Ordnance Department. The Chicago Ordnance District alone, as of December 15, 1941, had made prime contracts with railway supply companies and other industries in northern Illinois, northern Indiana, the Upper Peninsula of Michigan and the states of Wisconsin, Iowa, Minnesota, North Dakota and South Dakota totalling $597,966,022, of which amount $181,180,861 are with six railway supply companies alone.

These six companies and the dollar amounts of the prime contracts placed with them by the Chicago Ordnance District alone are as follows: Pressed Steel Car Company $71,448,730; Pullman-Standard Car Manufacturing Company, $60,356,194; Guiberson-Diesel Engine Company (Buda Company), $24,979,368; Allis-Chalmers Manufacturing Company, $14,155,022; Pettibone-Mulliken Corporation, $5,702,071; and American Brake Shoe and Foundry Company, $4,539,576. The items and amounts involved in these contracts are as follows: tanks, $117,619,927; tank engines and parts, $24,979,368; gun carriages, $14,973,077; anti-aircraft gun mounts, $11,829,208; shells, $8,285,846; tractors, $2,238,501; mortars, $1,147,711; and miscellaneous, $107,223. In addition, 18 other railway supply companies in this district hold prime contracts for $1,436,110 of shells, tools, paint, nitrogen and other materials and many others have sub-contracts totalling several hundred million dollars.

In addition to manufacturing war materials, the railway supply companies as a group have further contributed to the nation's war program by supplying the railroads with greatly enlarged quantities of equipment and materials needed for their development, operation and maintenance, aggregating about a billion dollars. While their total production has exceeded that of any recent year, it has been accomplished without taxing facilities. At the present time only about 30 per cent of the output of the railway supply industry consists of war materials and this has taken only part of the avail-

Industry Serves the Railroads and the Nation

Plant capacity adequate to meet present and prospective demands of both

By Raymond A. Doster

Associate Editor

able productive capacity of the industry. Many facilities are still idle and many plants are still working single shifts.

In 1942, and for the duration, the railway supply companies will be called upon to produce still larger amounts of war and railroad products. On the basis of present and prospective orders, however, these companies should continue to be able to meet the needs of the railroads and the defense agencies. War expenditures have been estimated at 40 billion dollars in 1942 and 55 billion dollars in 1943, as compared with the present 35 billion dollar rate of production. Even if the present rate of expenditures should be doubled in 1942 and 1943 and the railroad supply companies should be required to double their production of war materials, they will still be able to handle their railroad business.

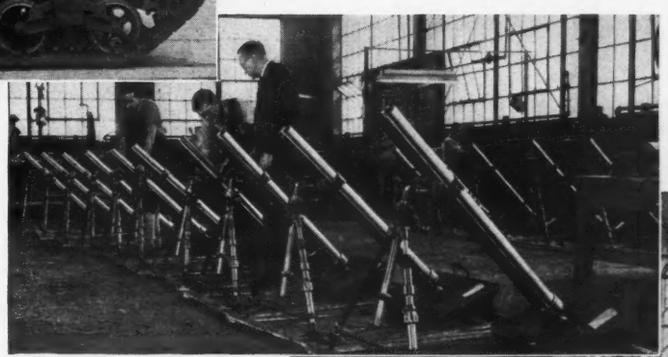
In 1939 the railroads adopted a program calling for capital expenditures of $2,600,339,000 from September 1, 1939 to September 30, 1943, the details of which are shown in the accompanying table.

They also planned at that time to increase substantially their expenditures for maintenance of way and structures and for maintenance of equipment during the same period.

Although they have followed this program closely, some deviations have been made. The freight car purchase program, for example, was revised prior to December 7 in accordance with anticipated 1942 car requirements and the need for conserving materials. According to Ralph Budd, former transportation commissioner, Advisory Commission to the Council on National Defense, the car building program for the 12 months ending October 1, 1942, must provide a minimum of 150,000 new cars to meet the ever-increasing traffic demand. On December 9, the Association of American Railroads reported that 87,000 cars were on order. To maintain the car supply, extensive repairs will also be made to existing cars.

According to present plans for 1942, only 13,000 cars

A-1 Cast Steel Tanks are Completed Ahead of Schedule



81 mm. Trench Mortars and 155 mm. Gun Carriages Are Also Among the Items Turned Out By Railway Supply Companies

will be retired, with the result that many will be repaired and about 60,000 will be rebuilt.

The demands upon the supply companies for replacement parts incident to these extensive car repair programs will approach the demands in a normal year of new car purchases. This is demonstrated by the experience of one railroad which is now repairing several thousand open top cars that are 28 to 30 years old, at a cost of $1,700 per car, of which about 1,270 represents purchases from manufacturers.

Under a program for maintaining the railroad plant, the supply companies will also be called upon to furnish increased amounts of maintenance materials. It is estimated that expenditures for maintenance of way and structures may approach $700,000,000 in 1942, compared with about $590,000,000 in 1941. The amount of rail which the railways estimate that they should lay in 1942 totals 1,500,000 tons; this compares with approximately 1,200,000 tons laid in 1941.

Capital Expenditures Planned for the Period from September 1, 1939 to September 30, 1943

Period	Locomotives Units	Locomotives Cost	Freight Cars Units	Freight Cars Cost	Other Equipment, Cost	Total Equipment, Cost	Roadway and Structures, Cost
September 1, 1939-September 30, 1941.....	...	$131,920,000	.....	$388,318,000	$60,860,000	$554,398,000	$305,241,000
October 1, 1941-September 30, 1942.....	850	127,500,000	120,000	384,000,000	165,000,000	1,340,700,000	400,000,000
October 1, 1942-September 30, 1943.....	1,050	157,500,000	150,000	480,000,000			
Grand Total Sept. 1, 1939-Sept. 30, 1943..	...	$416,920,000	.....	$1,252,318,000	$225,860,000	$1,895,098,000	$705,241,000

Locomotive Companies Produce Variety of War Items

Outstanding among the railway supply companies which are producing war materials are the locomotive companies. The American Locomotive Company has accepted orders for the American defense program, the British government and for use under the lease-lend plan, totaling $163,000,000. These are being filled in 55 per cent of the capacity of seven plants. It is also adding to its plant capacity for tank construction in order to relieve encroachment upon its locomotive building space and to enable it to reserve 60 per cent of its locomotive shop facilities for railroad requirements.

This company is assembling tanks and gun carriages. On April 19, 1941, it delivered to the government the first of 685 medium M-3 tanks ordered on November 23, 1940. This tank consists of 14,000 parts, which required more than 2,500 drawings and its fabrication necessitated the placing of 350 different orders for materials, in addition to the engines, accessories, transmissions, armor plate and guns supplied by the government. On May 15, 1941, this company also delivered the first 155 mm. gun carriages on an order received on August 8, 1940. Because of its experience in intricate fabrication work, the Dunkirk plant was chosen for the carriage job and a building formerly used to manufacture gray-iron castings was entirely reconditioned for this contract.

The Baldwin Locomotive Works is assembling tanks, railway and anti-aircraft gun mounts and is manufacturing guns, shell forgings, armor plate, projectiles, battle ship turrets, marine Diesel engines, ship keels and propellers and metal and plastic airplane parts. Part or all of each of its eight plants are engaged in defense work. As early as October 18, 1940, this company opened a school shop at Eddystone, Pa., in anticipation of a shortage of skilled workers and during the first year of its operation more than 1,000 capable machine tool operators were graduated. Early this year, arrangements were made for "pre-employment" instruction in the schools of Philadelphia and Delaware counties through state employment offices under federal sponsorship. In April, 1941, this company delivered its first medium, 28-ton tank and on December 8 its first heavy 60-ton tank.

The Electro-Motive Corporation is building Diesel submarine engines.

Car Builders

The car builders, like the locomotive companies, are turning out large quantities of war materials. The Pullman-Standard Car Manufacturing Company, according to its third quarter financial report to stockholders, has a backlog of $77,500,000 of armament work. This company is assembling tanks, howitzer carriages and trench mortars, and is making shells, parts for anti-aircraft gun mounts, and wings for the new cargo airplanes. About two-fifths of the company's current output is going directly for defense and the remainder is for the railroads. Some of its plants which have been idle for a number of years have been re-equipped and placed in operation, and still others will be placed in service when they are required.

With an oral order on September 5, 1940, and with an idle plant laid out for building railway cars, machinery was located and bought, building changes were begun, machinery was designed and installed and production was started. Late in May, 1941, after incorporating changes ordered by the Army, a pilot tank was completed and on July 25, the Hammond shops of Pullman-Standard released the first two M-3 tanks for the British.

The Butler, Pa., plant of Pullman-Standard began with a bare floor in August, 1940, and on November 7 shells began to roll off the line. On May 20, 1941, the 100,000th shell was produced and the total reached a half million on September 5.

The Hammond plant of Pullman-Standard delivered its first 81 mm. mortar on May 8; it was tested by the Army at Erie proving grounds near Port Clinton, Ohio, on May 21 and shortly thereafter production was begun. This plant made its first production shipment of the United States Army's 105 mm. howitzer carriages on August 15.

Because the Pullman Car Works in Chicago was the first plant within the state to undertake a substantial contract for plane wings on a production schedule and because there were no nearby schools from which to secure aircraft mechanics, one of the first steps that the company had to take when it received a sub-contract early in 1941 for furnishing Douglas with outer airplane wings was to train new employees. Arrangements to pre-train qualified men were made with a number of private institutions, with the result that within a month after receiving the sub-contract, the training program was operating and within two months 117 students had graduated to the production line. Since that time, young men have been applying at a rate of 200 a week and as the program gains momentum, a stream of 275 mechanics a month are expected to move into active production work.

The American Car & Foundry Company turned out its first tank for the United States Army in May, 1940, on a contract for 329 received about six months before.

On August 2, 1941, it completed its 1,000th 12-ton tank and in November its 2,000th. On October 31, 1941, according to a letter to stockholders, $131,000,000 of uncompleted war work was on the books. The company is assembling tanks and making tank parts, shell forgings, fuses, bridge pontoons, and demolition bombs, among other articles.

Tanks, Shells, Armor Plate

After accepting the tank contract, the company found that its greatest difficulty was the securing of armor plate which it had expected to purchase already fabricated. When two established manufacturers could not make delivery in time, the company decided to manufacture its own armor plate under an entirely separate organization in its Berwick plant. In less than four months, it provided and installed 75 machine tools and built and completely equipped a new plant for the processing of armor plate. Subsequently it received orders for 3,089 light tanks, to be delivered within a period of 540 days and by August 2, 1941, the output had been built up to 14 tanks a day.

The Edward G. Budd Manufacturing Company is making bodies for army cars and trucks, bombs, shells and parts for planes and ships. The General American Transportation Corporation is spending $1,000,000 on a new plant and equipment which is already in production on shells for the new 90 mm. anti-aircraft gun. The St. Louis Car Company is using about 25 per cent of its facilities to fill orders for $2,000,000 of war work and is erecting three additional buildings to increase its production floor space.

The entire facilities of the Chicago plant of the Pressed Steel Car Company are now devoted to National Defense purposes. This plant, which had been idle for 10 years, was rehabilitated and within six months completed the first tank. This plant is also producing 155 mm. shells, on which it is ahead of schedule. The McKees Rocks, Pa., plant of this company is manufacturing other defense materials.

Although the steel companies have very little business direct from defense agencies, no group is more essential to the defense program. Steel, because of mechanized warfare, is more vital than ever before. So important is it that plants are being expanded rapidly. In the Chicago area, for example, the Carnegie-Illinois Steel Corporation, the Republic Steel Corporation, the Inland Steel Company and the American Steel & Wire Co. are enlarging their plants to the extent of more than $100,000,000.

Tractors, Guns, Motors

Among the companies whose normal output in part is used by the railways the International Harvester Company has about $100,000,000 of government orders on hand for crawler tractors, 37 and 75 mm. shells, adapter boosters for artillery recoil mechanisms, and large refrigerating units for Army camps. The company is also making a medium caliber anti-tank gun and is rebuilding old style 155 mm. gun carriages so that they can be hauled at speeds up to 60 m. p. h. International trucks are also being manufactured in various styles and sizes for the U. S. Army, the U. S. Navy, the U. S. Marine Corps, Great Britain and China.

In 1940, the Buda Company erected a new building at a cost of $900,000 for the manufacture of the Buda-Guiberson radial Diesel aviation engine. This engine was designed primarily for airplanes but was found to be adapted particularly to light tanks. In addition, the company is making high speed earth drills for use by the Army in drilling holes under bridges, roads and embankments preparatory to placing obstructions, tank traps and land mines to hold up an advance. For the Navy, this company is building gasoline and Diesel engines, and generator sets for cruisers, coast guard craft and other boats.

Fairbanks, Morse & Co. is building Diesel propulsion engines for submarine and other naval craft. The Safety Car Heating and Lighting Company, Inc., is making range finding and fire control apparatus. The Timken Roller Bearing Company is furnishing bearings and steel for implements of war and is manufacturing 37 mm. shot. The General Electric Company is producing varieties of war products, varying from completely electrical to completely non-electrical units with many in-between that are partially electrical.

Among other companies in the railway supply field that have prime contracts with the government and the products they are supplying are the following: Air Reduction Company, Inc., acetylene, hydrogen, oxygen, and nitrogen; American Brake Shoe & Foundry Co., steel forgings; American Bridge Company, structural steel; American Hair & Felt Co., artillery ammunition components; American Steel Foundries, steel castings; Austin-Western Road Machinery Company, construction and road machinery; Chicago Flexible Shaft Company, fuses and clipping machine blades; Chicago Malleable Castings Company, castings; Crucible Steel Company of America, tool bits, drill rods and high speed steel; and Cutler-Hammer, Inc., switches.

Miscellaneous Munitions

Duff-Norton Mfg. Co., forgings, jacks and parts for ammunition components; Garlock Packing Company, oil retainers; General Steel Castings Corporation, cast armor for tanks, castings for guns and steam turbines and ship castings; Independent Pneumatic Tool Company, tools, construction machinery and accessories for aircraft assembly plants; Johns-Manville Corporation, shell loading plant, asbestos products; Locomotive Finished Material Company, machine tools and naval ordnance; Manning Maxwell & Moore, Inc., cranes.

Sherwin-Williams Company, primer, paint, enamel and linseed oil pigment; Socony-Vacuum Oil Co., Inc., paraffin oil; Standard Forgings Corp., shell forgings, ammunition components; B. F. Sturtevant Company, heating systems; and Sullivan Machinery Company, air compressors. Templeton, Kenly & Co., jacks; Union Asbestos & Rubber Co., pipe covering, insulation materials and asbestos felt.

Vapor Car Heating Co., Inc., steam generating units, portable distilling plants and water distillation units; Vulcan Iron Works, air hammers; Western Electric Co., Inc., telephones, jacks and microphones.

Yale & Towne Mfg. Co., electric trucks, and door closers; and Youngstown Steel & Tube Co., steel bars and steel.

THE NEW YORK, NEW HAVEN & HARTFORD DINING CAR DEPARTMENT was host on December 9 to the Boston Stewards Club. This organization, which comprises stewards, managers and purchasing agents of restaurants, hotels, clubs, railroads, air lines and state institutions, held its regular December meeting aboard two dining cars of the road. Subject of the meeting was a discussion of the "tenderay" process, a new development which makes beef tender in only a fraction of the time formerly required for this purpose, which equipment has recently been installed in the Dining Car department's commissary.

How Railroads Fare Under the Priority Rules

Materials and equipment chief concern of railroads as the Nation rations metals to win the war

By D. A. Steel
Purchases and Stores Editor

AS the United States enters the war, the railroads find themselves face to face with their number one problem for 1942—that of getting materials and equipment. On the one hand, more material and equipment must be obtained to keep the railroads in repair; while, on the other hand, it is becoming more difficult to get materials and equipment because of the vast and increasing requirements for military purposes and because the means of getting them have become more complicated.

The Government has taken over the direction and control of the production and use of materials necessary to defense and railroads and the railway supply companies are increasingly restricted in the freedom with which they can do their buying. There is, moreover, a scarcity of materials which the railroads, as well as the army and navy, require.

Metals Under Rigid Control

A more or less rigid control is now exercised by war agencies over the production and distribution of aluminum, magnesium, tungsten, nickel, copper, zinc, rubber, vanadium, lead, pig iron, iron and steel and scrap. It is impossible to obtain these materials for some uses and several limitations have been placed on the quantities available for other uses. Priorities have already deprived people of work in hundreds of cities and towns, at least temporarily, by diverting materials from non-defense into defense channels, and positive restrictions have already been invoked over inventories and over manufacture for non-defense. Within recent weeks, rationing has replaced priorities in distributing steel plate and will soon be extended to other products of iron and steel.

One Year of Defense

It is scarcely realized that the entire defense program is less than eighteen months old and that only a year has passed since the Government began, in the name of defense, to take over the management of production and distribution of the material resources of the country. OEM (Office of Emergency Management), established on May 25, 1940, to co-ordinate defense agencies, was the first step. NDAC (National Defense Advisory Commission), appointed by the President on May 29, 1940, was the next. Then came OPM (Office of Production Management) to stimulate and direct the manufacture of planes, tanks, ships and guns for the building of factories in which to make them—but not until January 7, 1941. By this time, the functions of the Defense Ad-

OEM Photo

SPAB

Top Defense Board

Seated, left to right—H. L. Hopkins, Lend-Lease Program; W. S. Knudsen, Director General, OPM; H. A. Wallace, Vice-President U. S. and Chairman; D. M. Nelson, Executive Director and Director Priorities Division, OPM. Standing—J. V. Forrestal, Undersecretary U. S. Navy (present for Secretary of Navy Knox); R. P. Pattersen, Undersecretary of War (present for Secretary of War Stimson); Leon Henderson, Administrator, OPA and Director Civilian Supply Division, OPM; Sidney Hillman, Associate Director, OPM and Director Labor Division

visory Commission, with the exception of transportation, had been absorbed by other agencies.

OPM began with three divisions—production, priorities, and purchases. Labor was added on March 18. OPACS (Office of Price Administration and Civilian Supply) came on April 11, to stabilize prices and to study civilian industry. When OPM and OPACS began colliding with each other and the whole program of defense bogged down, OPM was re-organized on August 28 to include a civilian branch. OPACS became OPA (Office of Price Administration) and SPAB (Supply, Priorities and Allocations Board) was created as the top defense agency, to formulate policies, centralize the authority and direction over priorities and allocations and initiate and revise regulations over the production and distribution of essential materials.

OPM was reshuffled internally. Commodity sections were replaced by industrial branches, each to handle to completion all matters affecting key industries, subject to general direction and approval by divisional heads. They include branches over aircraft, ordnance, tools, construction, shipbuilding, foods, textiles, containers, pulp and paper, printing and publishing, lumber and building materials, plumbing and heating, electric goods, office machines and rubber.

Railroads were grouped under an automotive, transportation and farm machinery branch. More recently, OPM has been enlarged to include divisions to promote and arrange sub-contracting of defense production, to alleviate priorities unemployment and to promote conservation in the use of materials. Priorities offices have been established in the principal cities; also committees have been organized within each industry at the request of OPM to consult with the corresponding industrial branches of the defense agencies. A total of 24 committees and 82 sub-committees have already been formed and arrangements were concluded in Washington on December 12 to form a railroad and railway supply committee with 7 members from Class I railroads, 1 from the short lines, 1 from switching and terminal companies, 2 from locomotive builders, 4 from car builders and 5 from appliance manufacturers. Industrial branches of OPM, including the transportation branch, which were reporting to the Civilian Supply Division, were placed under the direct charge of the chief executive of OPM on December 20, 1941, to speed up their participation in the war production program, while three days later the President created the Office of Defense Transportation.

Defense first meant only the army and navy, the maritime commission, Great Britain and countries receiving materials under the Lend-Lease Act. It was later broadened to include civilian activities, with an A-10 priority or better. Priorities were first issued only for strictly defense work. They were soon extended in all directions. Military forces got their priority ratings out of two books —one listing materials entitled to ratings; another prescribing the proper rating for the work in question. Manufacturers applied to customers for priorities; customers applied to OPM. The simplest priority is the PD order, an individual preference rating—good for one order only. Next are the Pro orders, granting priority on materials for single projects—good for the duration of the project. Next are the P orders (blanket priorities) giving a consumer a priority for materials for a particular use—good until further notice. M orders (allocation) regulate the production and distribution of scarce materials—good until revoked. E orders give production preferences to equipment especially needed for defense and L orders set limits on the quantity of materials which can be produced.

The first P order was issued on March 12 and the first M order on March 22. By August, 18 P order and 8 amendments or extensions to P orders were issued, including P-8, issued June 18, allowing an A-3 priority to railroads for material for building new freight cars, while 22 M orders and 15 amendments has been issued. The railroads had been called upon to furnish estimates of their requirements of ferrous and non-ferrous materials, the first inventory control over metals was declared and priorities were created to permit manufacturers to replenish working stocks of defense materials. On July 21, order P-20, giving an A-3 priority for materials for constructing locomotives and P-21, allowing an A-3 priority on materials for repairing and rebuilding locomotives, were announced.

On August 1, Washington took over the distribution of pig iron. Six days later products of iron and steel were placed under mandatory control and on August 14, proposals were made to dismantle abandoned tracks to recover scrap, vanadium was brought under control, plans were launched to increase steel-making capacity by 12 million tons and consumers were requested to use more Bessemer steel to conserve scrap.

On August 19, the census began a survey of scarce materials and orders were issued to require contractors to assist in subleting defense work. On August 21, automobile production was cut 27 per cent. (The reduction will be 70 per cent in January, 1942.) Dealers in scrap were called to Washington. Producers of zinc were ordered to set aside 27 per cent of their output, subject to shipping instructions from Washington.

On August 28 came Priority Regulation No. 1, requiring all manufacturers and producers to accept defense orders and to observe priorities in making deliveries and on August 30, an A-2 priority was issued for materials for research laboratories. Manilla rope was placed under mandatory control on the same day and an A-3 priority was created for building auto-trucks and priority applications were expedited by dispensing with affidavits. On September 8, priorities were further streamlined by permitting priority numbers to be stamped on orders.

On September 9 came the long-awaited A-10 priority for repairs and maintenance for railroads. On September 16, a pipe-line to move oil to the seaboard was refused, in order to save steel. Copper scrap was placed under full priority control on September 30, with provisions requiring the approval of any agreements between railroads and manufacturers for the exchange of scrap for new material, and quotas of steel were authorized to keep warehouses and distributors running.

On October 2, further steps were taken to increase steel-making capacity. Two days later, lead was placed under allocation. On October 9, all iron and steel scrap was brought under the direct control of Washington, under conditions which require monthly statements of inventories and shipments. On October 9, the use of steel in non-defense construction was forbidden. On November 14, an attack on waste in industry was launched and the use of substitutes for metals urged.

October 16, the A-10 priority for repairs and maintenance was re-interpreted to include operating supplies as well as materials for strictly repair and maintenance. On October 21, order M-9-c, covering the distribution of copper was issued, restricting the use of copper in 100 listed uses, prohibiting the use of copper in new buildings after November 1, and curtailing the use of copper as much as 30 per cent for all other unlisted uses.

On October 27, orders were issued reducing the number of steel-shapes and angles after February 1. On November 1, came the proposal of SPAB to allocate the distribution of all steel and other scarce materials in

place of priorities. On November 7, the use of steel for office furniture was stopped and on November 10, the A-10 priority for repairs and maintenance was further revised to allow the use of improved material and equipment in replacements. On December 9, OPM was enlarged to include a section empowered to confiscate property and material when normal sources prove inadequate. On December 13, the use of iron and steel for stoves was curtailed. On December 18, Order P-22, granting A-10 priorities to railroads for maintenance and repair materials, was superseded by P-100, which continued the A-10 priority and liberalized some of the regulations. This action was followed on December 23 by revisions in general priority regulations to permit specific allocations of materials to be made by the Priorities Division, without regard to existing priority ratings and giving allocations precedence over priority ratings in distributing critical materials. During all this time OPA was issuing regulations affecting prices.

Thumbs Down on Passenger Cars

As matters now stand, the railroads have an A-3 priority on materials for building freight cars and locomotives, an A-3 rating for materials for the repair and rebuilding of locomotives, and an A-10 rating for materials and supplies for necessary repairs, maintenance and operation. These priorities compare with an A-1-a priority on the production of machine tools, A-1-d for cranes, A-1-c for airplane engines and propellors, A-10 for civil aircraft, AA for arming ships, A-1-d for radio equipment, A-2 for canning machinery and equipment, A-1-a for producing cutting tools, A-3 for producing mining machinery and equipment, A-1-f for tanks, A-1-g for guns, A-1-c for foundry repairs and A-10 for farm machinery and equipment. Railroads may also apply for individual priorities for special cases. A-5 priorities have been obtained on several occasions for railroad projects and an A-1 priority has been issued for rail. No priorities have been made available to date for materials for new passenger cars.

The priorities for the railroads came while all the railroads were straining to increase their equipment for peak traffic and when the plants of carbuilders were closed for lack of steel. They are used with all orders for materials for freight cars and locomotives and whenever suppliers requested them for repair materials and operating supplies or where suppliers have been prohibited from furnishing these materials without a priority. They have not in general been required for fuel, oil, forest products and miscellaneous materials, the supplies of which have not been severely reduced by heavy and continuous withdrawals for military purposes. One of the largest suppliers of lumber for new freight cars delivered every carload yast year on time.

Supplies Hard to Get

This was not true of metals or with materials for maintenance. According to a recent survey, deliveries of rail, which are normally made in from 1 to 3 months after placing orders, are now taking from 6 to 12 months. One order that was placed in July, 1940, is now promised for June, 1942; another order placed last October will not be delivered until next fall. Deliveries of track-fastenings, which were normally obtained in 1 to 2 months, are now taking from 2 to 10 months. Car and locomotive castings deliveries, which normally take 1 to 2 months, are now taking from 2 to 8 months. Forgings are now taking from 4 to 12 months, with main and side rods, in one case, taking from 10 to 12 months.

Deliveries of steel plate, which usually could be anticipated in two months, are now indefinite. Orders placed in March and April have not been delivered. Actual deliveries range from 6 to 12 months. Machinery varies the most. Pile hammers and ballast discers are obtainable in 2 months. Recently, a combination axle and wheel lathe promised in 6 months was delivered in 10 months. The time is 24 months for some machines. Specialties which took from 2 to 3 weeks are now taking from 4 to 8 weeks. Specialties that took 2 months are taking from 5 to 18 months. Some non-ferrous metal deliveries are prompt. Other products which normally are delivered in ¾ to 2 months after orders are placed, are now taking from 3 to 16 months. Lumber deliveries have been only slightly delayed in some quarters; in others, lumber which never took more than 2 months to get is now taking up to 8 months. One railroad has had no difficulty in obtaining car and locomotive forgings or machinery specialties, non-ferrous metals or lumber and is getting some deliveries of narrow plate, but has about given up hope of getting wide plates for

Average Time Required to Obtain Materials in Months Under Present Conditions

Road	Rail Normal 1-3 Mos.	Track Fastenings Normal 1-2 Mos.	Car and Locomotive Castings Normal 1-2 Mos.	Forgings Normal 1-2 Mos.	Steel Plate Normal 1-2 Mos.	Machinery Normal 1-2 Mos.	Specialties Normal 1-3 Mos.	Non-ferrous Materials Normal ½-2 Mos.	Lumber Normal 1-2 Mos.
(A)	I	3-6	2-6	3-8	I	—	3-8	2-4	3-8
(B)	8	6	3	6	6	4	4	2	4
(C)	10	5	4	7	8	18	5	6	5
(D)	6-9	6-9	3-4	7-10	6-8	6-12	6 & up	3-4	3-5
(E)	12	5-6	4	4	I	—	6	4-6	3-4
(F)	—	3-4	1½-2	4-9	10-12	—	—	½-4	—
(G)	I	I	1-4	1-4	I	2-3	6-18	I	2-4
(H)	12	2-3	2-3	—	6	1-2	1-2	1-3	—
(I)	4-6	3-4	2-3	10-12*	8-9	—	—	3-4	3-4
(J)	I	6	6	6	6	I	4	3	4
(K)	I	I	3-6	3-6	6-10	10-12	3-6	2-4	6-8
(L)	10	2-4	3-4	4	9-10	—	—	2	2-3
(M)	6	10	4	6	8	I	6	3	4
(N)	8	8	3-8	8	8	—	4-6	1-2	4-8
(O)	I	8-10	6-8	8-12	10-12	12-24	4-8	6-10	4-6
(P)	4	4	2-4	2-4	4-8	6	6-9	2	2-8
(Q)	I	I	3	6	6-12	I	3	2-3	3-6
(R)	I	I	2-6	6-15	I	I	2-6	I	2-5
(S)	12	3	2	4	I	10	1-2	1	1½-2
(T)	—	4-6	3-5+	—	12	10-12#	2-3	2-3	2
(U)	I	6	½	½	I	—	—	½	½
(V)	12	4-6	3-6	2-5	4-6	2-5	3-6	1-3	2-4
(W)	7	4	3	3	3	—	2	3	5
(X)	I	4-6	3-6	2-5	4-6	I	3-6	2-3	2-6
(Y)	6	6	2-6	4-6	4-6	6-12	3-6	1-2	1-2
(Z)	8-10	8-10	6-8	6-8	8-10	10-12	8-10	6-8	8-10
(AA)	2-3	3-6	2-3	6-12	6-12	3-6	2-4	1-3	2-6

I = Indefinite.
* = Main and Side Rods.
+ = Couplers and Side Frames.
# = Shop Tools.

cars. Elsewhere, switch points ordered in May were only partially shipped in December.

"We are not shutting down any work because of material up to the present," writes one correspondent, who attributes this, however, solely to a favorable inventory condition prior to the present emergency. Another reports, "We have managed fairly well to keep the storehouse stocks up to requirements sufficiently to avoid shutdowns of work up to the present by watching carefully the deliveries from manufacturers and anticipating needs accordingly."

Another railroad has locomotives tied up for fire-box steel. Still another railroad has managed to avoid shutting down work so far, by obtaining materials from jobbers until deliveries could be obtained from mills. One railroad has 30 freight cars tied up, waiting for plates and shapes ordered last August. One report states that although shutdowns or postponement of important work because of material shortages have been avoided to date, the ability to obtain material is becoming more difficult each week. One car-repair program has been shut down since March for lack of steel plates. Elsewhere, coal chutes and turn-tables have been delayed six months waiting for steel.

In the East, difficulties of getting material have prevented the commencement of work on 300 steel hopper cars which was to have been started early in September, and it will be at least another month before work can be started on 100 hopper cars ordered in October. In the South, signal work is being delayed because of the failure to obtain wire and cable which has been on order six months. In the Northwest, a serious shortage of steam power will occur on one railroad unless firebox steel that was ordered last June is received this month.

Priorities No Protection

For the most part, orders carrying higher priority ratings than railroad ratings are reported as the immediate cause for these difficulties. Under the priorities system, orders with the high priority take precedence over orders with low ratings, no matter how much longer the lower ratings have been awaiting. An A-10 priority is inadequate to insure reasonable deliveries of frog and switch material to one part of the country and one large mill, because it has so large a volume of highly-rated priority orders reports that it is impossible to fill orders with A-3 ratings.

This situation has been aggravated, according to one report, by the extreme difficulty or inability to get much official advice direct from OPM. Another report states that it has been much easier to obtain materials for coal mining under an A-8 priority than to obtain materials for railroads with the A-3 priority given, and that an A-10 priority rating means next to nothing, as ratings are now evaluated by producers of railroad materials. This observer believes that the railroads have been sadly neglected under the priority system.

Neither is much improvement expected under allocations, judging from one report, unless the OPM adopts a new attitude toward the railroads. "Each month, we are required to submit plate schedules for approval and, when allocations are made, there is little if any tonnage left for the railroads." The same manufacturer concluded from several visits in Washington, that no one has sufficient influence with the OPM to keep the railroads from being treated as step-children.

Nevertheless, one report would not ignore the fact that the railroads have been using materials to take care of abnoral requirements and that a lot of railroads are spending money to acquire new facilities and to repair old facilities which should have been re-conditioned three years ago if money had been available. It was suggested from this source that the anxiety of the railroads over the material situation has been premature. The position is also taken that the railroad problems are well understood in Washington and that the situation is about as good as the railroads have a right to expect, considering the desperate military emergency and the problems facing the defense agencies in their effort to provide the defense needs.

Meanwhile, railway supply companies, car and locomotive builders are still waiting for metal, foundry work has been slowed up for pig iron and companies which use copper and brass in specialties, particularly for passenger cars, have been hard-hit by provisions in copper-ruling, the effect of which has been to postpone for six months, shipments which are now needed and could be made at once. The irony of this lies in the delay that this is creating in the reconditioning of passenger equipment in which a million and a half soldiers were moved in 1940, and which is not now available in sufficient amounts to make sudden mass movements of troops.

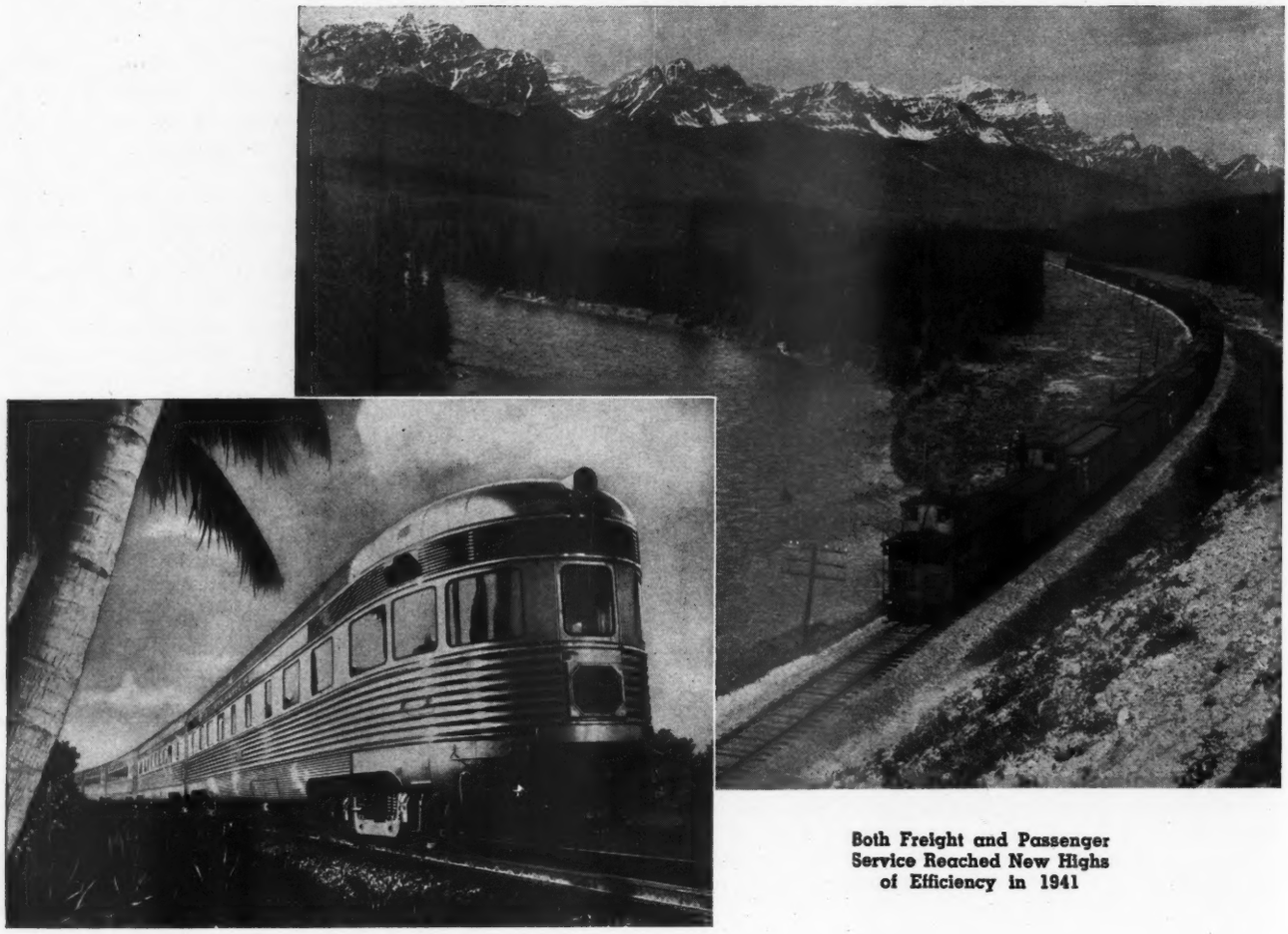
It has been explained repeatedly, in Washington that priorities have not caused the shortage and are used only to insure speed in military work and to make an equitable distribution of any residual supply for civilian consumers. In actual practice, they have not worked as well as was hoped, however, and the country must now experiment with allocation.

Looking Ahead

Disquieting aspects of the present material situation for the railroads, are the enormous requirements for ferrous and non-ferrous metals which have suddenly been thrown on the manufacturing industry, the further dislocations this will create in the routine to which the railroads and railway supply manufacturers have been accustomed, and the pressure on consumers to order further and further ahead as deliveries become slower and slower, the effect of which is to reduce further the supply of some needed materials. Some roads no longer start large programs until all the material is on hand.

Encouraging aspects of the situation are the wider appreciation of the importance of the railroads among agencies responsible for the success of the war, the resourcefulness of the railroads in meeting emergencies and the improvements which have already been made in organizations to handle the present problem. Personnel for procurement has been enlarged, reclamation and conservation practices have been renewed with vigor and the use of substitutes is under active study. Steps have already been taken to simplify the production of scarce materials by reducing the width of plates for freight cars and by reducing to 13 the permissible number of types of cars to be ordered. Delays in lumber can be reduced by using multiple lengths for cars. The railroads have also begun to prepare more accurate estimates of their requirements.

Out of the welter of economic and other changes which all-out defense and then all-out war have created in this country, it is now clear that neither the railroads nor the supply industry realized the full extent to which they would be restricted in their buying any more than the Government realized, at first, the importance of the railroads to the Nation's program and that both the railroads and the Government must now speedily resolve all their diffierences and doubts over the needs of the railroads and the needs of the Nation and collaborate to avoid disruptions of service resulting from a shortage of materials or delays in obtaining them.



Both Freight and Passenger Service Reached New Highs of Efficiency in 1941

Railways Met 1941 Demands With Flying Colors

Provided freight and passenger service adequate for greatly increased needs of civil and defense programs

By Charles Layng

Transportation Editor

DURING the year 1941, the railways produced more transportation than in any year in their history. The number of tons of freight carried one mile approximated 459 billion—almost three per cent over the previous all-time record established in 1929. Important, too, they were prepared to do still better, except for factors other than rail transportation that proved restrictive in such mass movements as wheat and ore.

With considerable logic, the present period may be compared with that of the last war period. We entered World War 1 without having made any preparations for it, and we were at war then for a total period of 19 months. This time, on January 1, 1942, we have also been at war for 19 months; that is to say, 19 months have elapsed since we began spending for war on an unlimited basis. The expenditures of the government for actually carrying on the war in the year 1918 were only 12 billion dollars, while, in 1941, in active preparation for war, the government spent about 16 billion dollars; so that, actually, the war expenditures of 1941 were greater than those of 1918.

Thus, it is fair to compare what the railroads accomplished in 1941 with what they did in 1918—but there was a great difference in actual conditions. When we entered the war in 1917, the railroads had already been confronted, for three months, with the largest car short-

age that they had ever experienced, and that condition continued through 1918. This car shortage sharply curtailed the amount of traffic that the railways could handle, so that the actual increase in traffic in 1917 was only about 9 per cent, and in 1918, only about 3 per cent, and the overall increase for the two years was only about 12 per cent.

This time, on the contrary, when we began our preparedness program in June, 1940, the railways had large surplus capacity. They had learned how to operate more efficiently and, in the last year and a half, they have learned even more. As an example, the total ownership of road freight locomotives for the first nine months of 1918 was 31,544 and it was 29,248 for the similar period of 1929, as compared with only 21,754 for 1941. Freight cars on line (including private line cars) averaged 2,433,144 in the first nine months of 1918 and 2,466,451 in 1929, as compared with only 1,890,313 in 1941. In other words, despite this sharp decrease in equipment owned, the railways actually produced 15 per cent more ton-miles of freight service in 1941 than in 1918; and 3 per cent more than in 1929; they also produced 41 per cent more than in 1939, and 26 per cent more than in 1940. Furthermore, instead of car shortages of serious proportions as in 1917-18, there were car surpluses in 1940 ranging from as high as 190,000 cars to a minimum of 78,000 cars; and, in 1941, there were surpluses ranging from as high as 190,000 cars during the coal strike in April to a minimum of 40,600 cars in the week ended October 11. During 1941, there were absolutely no car shortages—the nearest approach being an occasional "tight" situation here and there in connection with supplying certain types of equipment. As far as the "old red box car" was concerned, it was there at the time and in the quantities needed by the shippers.

This was accomplished despite the fact that the national defense program presented some entirely new car-handling problems. Transcontinental traffic, requiring many days usage of box cars per trip, was enhanced materially by the removal from service of large numbers of intercoastal ships. The various government and defense projects in widely scattered locations required the movement of a large volume of construction materials and other traffic, frequently in special equipment. The accelerated pace at which lend-lease materials are moving is producing a large volume of traffic, much of which may necessitate long car hauls. The entire movement of defense traffic is also characterized by sudden and frequently unexpected demands for special services.

Fortunately for the railways and the country as a whole, operating officers are accustomed to such demands. Furthermore, through advance planning, certain agencies have been set up by the railways to eliminate much of the suddenness of the demands and also to aid in the complicated and difficult task of providing proper and efficient car usage. Ralph Budd, transportation commissioner, National Defense Council, and the executives of the Association of American Railroads have studied the prospective needs of government and industry in the present emergency and have kept the railways currently advised of probable trends. The military section of the Car Service Division, A. A. R., has made itself, in effect, almost a part of the quartermaster corps and the resulting close co-operation and mutual understanding have been most important factors in handling defense traffic smoothly and without a hitch. To eliminate bottlenecks at the port yards, a port traffic bureau of the A. A. R. was set up which has kept terminal facilities at the ports in a fluid condition, through close co-operation.

This co-operative spirit has further manifested itself in the successful efforts of shippers to improve car handling. During the period of all-too-plentiful car supply, certain practices developed that, under the then-existing circumstances, were excusable. As early as the fall of 1939, however, it became apparent that these practices were highly uneconomic and undesirable during periods of heavy traffic. Apprised of the situation by the regional advisory boards, the shippers have done a most creditable job in assisting the railways to meet the emergency. All over the country, shippers are saving hundreds and thousands of car days by revising their loading and unloading practices, frequently at some financial cost to themselves, but always for the general good of all.

Moving the Wheat

Although car loadings were consistently higher every week during the first five months in 1941 than they were in 1940, the first real test that faced the railways last year was the wheat movement. Faced with the prospect of an unusually large crop, the railways made their customary advance survey of probable box car needs. Because of the unusual demand for cars, the total number of box cars on western lines, particularly of home ownership, was below the requirements for handling the impending crop and action was immediately taken to increase the supply. On April 9, the Car Service Division issued quota orders to the eastern and southeastern lines covering the return of western box cars, and, on May 13, this was supplemented by the issuance of Special Car Order No. 43, which required the empty return movement of western box cars as soon as they were unloaded in the East. These measures proved so effective that, between April 15 and July 1 there was an increase of 50,445 box cars available in western territory, including a gain of 35,922 box cars on the 11 principal railways directly concerned with the wheat movement.

Then the government took possession of the immense amount of "loan" wheat of the 1940 crop which was in storage in Midwestern elevators and began moving what eventually amounted to more than 115,000,000 bushels of wheat to other elevators, thus requiring the railways to handle the 1940 and 1941 crops at the same time. To meet this situation, the western railways made new records in getting the wheat to junction points with eastern lines, which in turn co-operated in getting the empties back to the loading territory quickly. Thousands of cars, for example, were moved from Chicago to Baltimore, unloaded at the elevators there and the empties returned to the western lines at Chicago within five days. The railways were adequately prepared for the unusual requirement of handling two years' crops at one time. Actually, heavy rains delayed the harvesting of the 1941 crop.

It soon became apparent in view of the vast amount of government loan wheat in the western elevators for which space could not be found elsewhere that the problem would be one of finding storage space rather than any lack of rail transportation. The final winter wheat crop amounted to 671,293,000 bushels, and the total wheat harvest of the country was 945,937,000 bushels. Nevertheless, throughout the shipping season, the railways were prepared to supply cars for every bushel of grain that could be unloaded promptly, not only of new wheat but of loan wheat from previous years' crops as well. However, in view of the emergency, it was also apparent that the railways could not be expected to supply box cars for the storage of grain in yards and sidings, and the Car

Service Division so notified the Department of Agriculture and other governmental agencies having to do with the handling of grain. At the major terminals, it was necessary to issue embargoes because the elevators were full. However, all loan wheat for storage on which space allocations could be shown and all free wheat for sale in the market was accepted as offered and handled without delay.

Open-Top Car Demand

Still another test was afforded by the movement of ore. Early in the development of the defense program it became apparent that the steel mills were going to require more ore than ever before and that the transportation agencies would be called on to deliver to them quantities exceeding all previous figures. The railways set about to meet these new and enlarged demands, with the result that they at all times provided greater capacity than the available lake boats were able to absorb. A further limiting factor at times was the capacity of the mines to produce. The lake shipping season was finally closed on December 6, earlier than was otherwise necessary by reason of the fact that no more space was available at the steel plants for stockpile storage of ore. In spite of these limitations the 1941 tonnage of ore handled by the railroads exceeded last year's shipments by approximately 28.6 per cent and was nearly 17 per cent greater than that for 1929 (the previous record).

This and the all-rail movement of a large tonnage of iron and steel products that were formerly moved by rail-water, have increased the demand for open-top cars of every description. The increased loading of coal, which is well over 1940 despite the cessation in production in the month of April, increased the demand for hopper cars. These factors created an occasional local tight situation for a day or two, but, in general, the railways have been able to handle currently all business offered for loading in this type of open-top car. This has been accomplished by speedier turn-arounds of such equipment, brought about by co-operation between the railways, and the strict observance of car service rules, such as the "100 per cent" rule on unbilled cars and Coal Car Order C-411. The supply of open-top cars has also been increased materially by purchases made in 1940 in anticipation of the demand, this equipment being delivered during 1941, and by a drastic reduction in the number of unserviceable cars of this type resulting from the widespread repair programs conducted by the railways.

The Fall Peak

While the fall peak was materially less than had been estimated by various authorities, the railways did handle well over 900,000 cars per week in October. Moreover, the usual aftermath of a steep drop in carloadings did not follow in November and December, since the defense traffic continued unabated to level off the customary loss of seasonal traffic. The railways were never pushed to handle this traffic and there were no car shortages, except for local tight situations brought about by unusual demands for special equipment, such, for example, as 50-ft. automobile cars equipped with loading devices for the larger models.

The roads in the territory between Iowa and Ohio were required to make plans for car supply for an estimated soybean crop of 110,884,000 bushels which would normally have been harvested and shipped co-incidentally with the peak traffic. The size of this task may be realized when it is considered that last year's crop amounted to only 79,837,000 bushels and the average yield for the past ten years has been only 35,506,000. After all preparations had been made to supply cars for this movement, heavy and continued rains again prevented harvesting and damaged the crop, so that the impending rush did not take place.

Perishables

The demand for refrigerator cars has also been much increased, as the market for perishable products rose. The problem of handling these cars has been further complicated by the fact that the need for shipping perishable foodstuffs in quantities to big army camps in scattered locations has dislocated the usual routes of refrigerated cars. In practically every growing area, unusually heavy crops have been harvested this year, for which a ready market was found. Despite all this, however, the refrigerator car supply has been ample for all requirements, as a result of purchases of new cars, keeping bad-order cars at a minimum and more effective car handling.

Beginning about January 1, the demands for refrigerator cars will be unusually heavy in the Southeast. This is because of the large crop expected and also because of the diversion of coastwise ships to other uses than handling perishables north from Florida. Arrangements have been worked out, however, to take care of this increased demand for cars and no delays or interruptions to service are anticipated.

The outstanding improvements in freight service of the last few years were continued in 1941. The fast overnight trains showed increases in the amount of traffic handled. While there have been several improvements in freight schedules this year between various points, the tremendous additional load of defense traffic has caused the railways to concentrate on the maintenance of existing schedules rather than increasing the number of high-speed trains already operating.

Passenger Service Improvements

The installation of 36 new streamlined trains during the calendar year of 1941 brings the total of such trains now in operation to 125, involving more than 1,000 new, lightweight streamlined cars. Far more new streamlined trains were installed in 1941 than in any previous year, and, as of January 1, 1942, there were still 22 such trains being built by the manufacturers for spring delivery.

Among the outstanding passenger service improvements in 1941 were the re-equipping of the Twentieth Century Limited of the New York Central and the Broadway Limited of the Pennsylvania; the installation of new Cities of Los Angeles and San Francisco on the C. & N. W.-U. P., and C. & N. W.-U. P.-S. P. respectively, thus giving the Chicago-Los Angeles route two 17-car trains for the first time, and the Chicago-San Francisco route two 39¾ hr. streamliners for the first time. The roads mentioned also participated in the installation of nearly 100 new streamlined cars in the Los Angeles and San Francisco Challengers.

The Southern Pacific began operation of the new streamlined Larks between San Francisco and Los Angeles. These all-Pullman, all-room trains feature a club-lounge-diner unit of three articulated cars, without partitions between. The S. P. also inaugurated the Oakland Larks and the San Joaquin Daylights during the year.

The New York-Florida schedules and consists were greatly improved during the year, both by trains carrying sleepers and by de luxe, streamlined coach trains.

(*Continued on page 31*)

Courtesy C. R. I. & P.

Courtesy Signal Corps

Courtesy A. T. & S. F.

In the Service of the U. S. A.

Railways Geared to Needs of Army and Navy

Transportation records of 1918 already shattered—All-out victory program foreshadows still larger rail movement

By Raymond A. Doster

Associate Editor

WITH a completeness and finesse that overshadow their performance during the World War, the railroads of the United States, in 1941, successfully met the requirements of the Army and Navy for the transportation of large numbers of troops and large quantities of war materials and at the same time met all demands for the movement of civilian goods. Keen foresight and preparation made these outstanding accomplishments possible.

The movements of troops, for example, was on a scale that frequently approximated or exceeded that of 1918. During the first 10 months of 1941, the railways carried 2,227,196 soldiers, sailors, marines, C.C.C. boys, and selectees. In November and particularly in December, after the declaration of war by Japan, the total was increased materially. The army maneuvers in 1941 were the most extensive ever held. They started in May in the vicinity of Ft. Ord, Calif., and continued until December 1, when the First Army concluded its tactical operations in the Ft. Bragg-Ft. Jackson area in the Carolinas.

On three occasions prior to December 1, more than 100,000 soldiers were traveling by rail at one time. During the maneuvers in the Camp Beauregard, La., area, from September 1 to 30, a total of 30,259,199 men were moved distances up to 1,000 miles. For the November 3-30 war games in the Ft. Jackson-Ft. Bragg area, 146,000 soldiers were transported from points as remote as Massachusetts.

With few exceptions, the bulk of the troops headed for maneuvers moved on special schedules to avoid interference with regular trains. The average troop train carried between 250 and 500 soldiers—about 50 men to each coach—and contained as many as 35 coaches, baggage, kitchen, box, flat, and other cars.

The magnitude of the transportation of a single unit is illustrated in the movement of the First Armored Division from Camp Polk, La., on the Kansas City Southern, to the First Army maneuvers at Rock Hill, S. C., on the Southern, in October. Within three days, starting on October 27, a total of 3,500 officers and men, their equipment and the division's tanks, armored cars and other material were moved over 13 different railroads in 20 trains containing 508 flat cars, 92 tourist-sleepers, and 20 kitchen-baggage cars. Individual trains contained from 4 to 6 tourist-sleepers for the officers and men; a kitchen-baggage car for the preparation of meals, and from 19 to 32 flat cars for equipment and material.

Another phase of the activities of the railroads in connection with these recent maneuvers was the handling of wounded and sick men. Under the law of averages, a certain number of men in any large group will be injured or will get sick during a given time. This was recognized by the War Department when the maneuvers were arranged, and plans were set up under which hospital trains would be operated every day from the maneuvers areas to army hospitals. In accordance with these plans, the railroads set up cars and trains at various points throughout the maneuvers areas and operated them daily.

To determine the speed at which trains could be loaded and started on their ways, a test was made during the maneuvers this year near Centralia, Wash. Twenty-five trains were lined up on tracks north of Centralia, pulled to the starting point, loaded and then dispatched. The longest time required for loading 500 men on a train was two minutes and the shortest 48 seconds.

In this handling of troops, the railroads and the military branches of the government should be credited with clear foresightedness, in that, without any knowledge that the occasion would arise, they laid out their plans and set up their organizations for the transportation of the armed forces many years ago—in 1914. The plan set up at that time, which was successfully followed during World War No. 1, is the plan which, with certain modifications, is in effect today.

When the plan was conceived, a committee of railroad men was appointed to be the sole contact between the railroads and the military branches, in the handling of the personnel of these branches. That committee consists of six men, each representing a different section of the country. It is called the Interterritorial Military Committee. Each year, that committee has met, periodically, with representatives of the military branches, to negotiate a yearly contract for the handling of military passengers. These conferences have dealt not only with the bare terms of the contract, but also with every phase of the question of passenger transportation. During the years following the first World War, and prior to 1940, the amount of military passenger traffic was comparatively small. Most of the traffic was that of the Navy, except for the National Guard traffic moving to and from state encampments each summer. However, regardless of the amount of the traffic, the railroads and the military branches always kept before them the thought that at some time an emergency might develop which would demand all the best efforts of the railroads and the military branches to carry on the necessary transportation work.

When the present emergency arose and it was decided to call a large army of selectees into the service, the railroads and the military branches were prepared for they were ready to proceed under the same system that had been in effect for a number of years. All that had to be done was to expand the organizations. How well this work had been done by the railroads and the military branches was demonstrated in a meeting held in Washington in September, 1940. At that time, the representatives of the War Department called the Interterritorial Military Committee into conference for the purpose of adopting definite plans for handling the new selectee army. Within the space of about five hours, complete arrangements were perfected for the handling of the selectee army by the railroads, and the plan perfected on that day in September, 1940, has continued in effect successfully up to the present time, and all movements of the new army have been made without failure or criticism.

To facilitate the handling of all transportation of military personnel, the plan in effect between the railroads and the military branches provides that, when there is to be a movement, request for the routing of that movement will be made direct to one of the members of the Interterritorial Military Committee, depending upon where the traffic originates. The member of the Interterritorial Military Committee then arranges, direct with all the railroads interested in the movement, for the handling of the traffic. These arrangements include advice as to the number of cars necessary, the class of cars desired, the schedule, and everything else having to do with the movement of the men. In this way, only one man in a given territory need be contacted by the Army, rather than each individual railroad, and that man makes complete arrangements. In addition, and in order to be ready at all times to take care of emergency movements, or to iron out any difficulties that may arise, the Interterritorial Military Committee has a representative at each post, camp, and station in the United States, who is charged with the duty of co-operating with the local officers in carrying out any transportation problem which may develop. These local representatives are necessary, in view of the fact that there are between 450 and 500 separate posts, camps, and stations in the United States.

The handling of selective service men, likewise, was a sizeable task. The Pennsylvania, for example, transported more than 380,000 selective service men from home points to induction centers in the eight months between January 1, 1941, and August 30 on more than 860 special trains and a large number of extra cars on regular trains. The averages for the period were 12,300 selectees and 28 special trains per week.

Freight Movements for Army and Navy Also Planned

A well organized plan has also been worked out for the handling of government freight. When the railroads were called upon to distribute materials for the construction of plants and army and navy facilities, they handled this war-time load without the confusion of 1918, even though the total service performed in 1941, measured in ton-miles, was actually greater than in either 1929 or in the peak war year of 1918. Specific examples of the manner in which the railroads anticipated and met each problem in 1941, testify to the thoroughness of their preparations.

The congestion at ports in 1918 has not been repeated to date, although the volume of war traffic moving through North Atlantic ports has closely approximated and in some weeks exceeded that handled at the peak of the World War movement. At New York, the unloading of export and coastal freight increased from an average of less than 500 cars per day in the early months of 1939 to more than 1,200 cars per day in November, 1941. At that time, the railroads had a six days' supply of freight on wheels and an additional five days' supply in pier and ground storage, which provided a sufficient "bank" of freight to avoid the possibility of delay to ships awaiting cargo. During October, 1941, more than 1,200 carloads of freight were delivered to boats at New York each working day without confusion, compared with an average of 1,350 carloads in October, 1918. At all ports in the United States, about 3,000 cars were unloaded daily in November while the average number of cars on hand at all ports varied between 12,000 and 15,000 and produced an average "bank" of freight of about five days.

Behind the railroads' record of handling government material is another story of their contribution to the Defense Program. That is the developing and servicing of government projects and it is well illustrated by the

part played by the Norfolk & Western in the creation of the $40,000,000 Radford, Va., ordnance works, one of the largest and most complete powder plants in the country. This railroad assisted the War Department in the selection of the site, hauled material for breaking the ground, transported construction materials, operated commuter trains for workmen, delivered equipment and machinery that was to be installed, and currently feeds all raw materials to the plant and carries away its finished products.

Transcontinental Lines Have Greatest Task

Although all the railroads of the United States have responded to the Nation's call, the contribution of the transcontinental lines has been especially outstanding. Defense appropriations on the Pacific coast exceed five billion dollars and the task of transporting the materials required for these purposes fell to these railroads. These appropriations include: $200,000,000 for shipbuilding and $398,000,000 for aircraft at Tacoma, Wash., and Seattle; $106,000,000 for shipbuilding at Portland, Ore.; $1,000,000 for navy development at Eureka, Calif.; $57,000,000 for army development at Ogden, Utah; $133,000,000 for army and navy development, and $758,000,000 for shipbuilding in the San Francisco area; $5,000,000 for navy development at Hawthorne, Nev.; $75,000,000 for army development north of Los Angeles, Calif.; $2,300,000,000 for aircraft, $213,000,000 for shipbuilding and $110,000,000 for army and navy development in the Los Angeles area; and $43,000,000 for army development at Phoenix and Tucson, Ariz., and El Paso, Texas.

The Southern Pacific, for example, is carrying the heaviest traffic in its history. The work done by this road in 1941 is estimated to reach 25 billion ton-miles, as compared with 16½ billion in 1929 and 17½ billion in 1940, the all-time peak year. In terms of work being done, the military program ramifies into many channels. On the Southern Pacific it has meant the operation (last August) of 25 special trains within a period of three days, for the mass transportation of 10,000 soldiers a distance of 900 miles. It has meant the carrying of ship stern castings with a clearance of only four inches above the rails. It has meant the movement of millions of tons of building materials, food supplies, and equipment for the government's account.

Future Traffic Will Be Even Greater

The declaration of war upon the United States by Japan, Italy and Germany has speeded up and expanded our military efforts still further, and as a result demands upon the railroads for the transportation of troops and supplies will be the greatest in history. On December 8, an "all-out victory program" was announced which calls for a total outlay for defense purposes of 150 billion dollars. Such an expenditure will more than double the current armament program for which appropriations and authorizations are now nearing 70 billion dollars. The goal of the program is said to be an expanded war effort that will raise war expenditures from two to four or five billion dollars monthly during the next two years. The plan includes the expansion of plant facilities, a seven-day work week and a revision of production schedules upward. Most of the raw and finished materials of this program will be moved by rail. Armed forces will be increased and they, with their equipment and material, will be moved by the railroads.

Some idea of the railroad job ahead may be afforded by recalling an estimate made by Captain Potter of the U. S. navy in 1931. At that time, he said that in the first year of an emergency centering on the Pacific coast, the railroads would be called upon to deliver 12 million tons of supplies on the West Coast for naval vessels alone, and another 12 million tons for work at navy yards. This is the equivalent of 1,650 cars daily. This estimate must now, of course, be revised upward greatly and to it added the requirements of expeditionary forces and the army camps and facilities on the Coast.

Railways Met 1941 Demands With Flying Colors

(*Continued from page 28*)

Summer service between Boston-New York and Florida was provided this year on a scale never before attempted. Fast schedules and de luxe equipment attracted more summer vacationers to the Florida coast than ever before.

As an outgrowth of the co-operative scheduling of the Chicago-Florida coach streamliners in December, 1940, schedules for both coach and Pullman trains on the three routes involved have been put on a co-operative basis for the 1941-42 winter season. Each route will operate certain trains every third day during the season, so scheduled that through passengers will actually have an augmented service available, although the railways involved will save nearly 50 cars as the result of the co-ordinated scheduling.

Serving the Southeast also are the Southerners operating between New York and New Orleans via the Southern and the Pennsylvania, and the Tennesseans, between Washington and Memphis, via the Southern and the Norfolk & Western.

These trains have materially improved the service between their terminal points as well as to many intermediate cities and towns.

Both the Milwaukee and the Burlington established 8-hr. schedules between Chicago and Omaha during December, 1940, protected by streamlined trains. As a result of this, schedules between Chicago and Lincoln, Nebr., Sioux City, Iowa, Sioux Falls, S. D., and the Black Hills were materially improved during 1941.

The Empire State Expresses of the N. Y. C., installed in December, 1941, give faster and better daylight service between New York, Buffalo, Cleveland and Detroit than any heretofore available. Boston-Washington service via the New Haven and the Pennsylvania was made faster in 1941 than ever before. Other installations of new trains include the James Whitcomb Riley of the N. Y. C., between Chicago and Cincinnati; the Prospectors, (Denver & Rio Grande Western) between Denver and Salt Lake City; the Zephyr-Rockets, (C. B. & Q.-Rock Island) between St. Louis and St. Paul-Minneapolis, and the Choctaw Rocket, (Rock Island) between Memphis and Amarillo, all of which afford the first streamlined service ever available between the terminals mentioned.

The modernized trains of the Pennsylvania and the N. Y. C. between Chicago and New York have been materially improved as to equipment and the Pennsylvania established the Jeffersonian, a de luxe coach train, between New York and St. Louis during the year. By the addition of modernized coaches and diner-lounges on several of its trains, the Baltimore & Ohio has greatly improved its service.

Certainly, during 1941, the impending threats of shortages of passenger car materials, the huge troop movements, and the general heavy traffic, have not seriously impeded passenger service improvements.

Construction and
But Further

Review of activities shows progress all along the line during the last year, but, with equal clarity, that in view of long-curtailed expenditures and the certain increased needs of our expanding war efforts, the railways require many new and improved facilities, and must spend more for the maintenance of both tracks and structures

By Neal D. Howard
Engineering Editor

The Requirements of the Armed Forces and Defense Industries, As Well As Those of the Railways Themselves, Will Call for Extensive Track Construction in 1942

IN the light of international developments of the last year or more, and especially those in December, 1941, which saw the United States plunged into the world conflict, it is fortunate that the physical properties of the railways are in a stronger position at the beginning of 1942 than they were at the beginning of 1941. With heavier traffic and somewhat increased earnings during the last year, the railways plowed back larger sums in construction and maintenance, and, to that extent, are in a better position to serve the country in its tremendous war effort than they have been at any time for a number of years.

Encouraging as this situation is in the light of the large potential demands that lie ahead, it must be remembered that the situation portrayed is relative, that the physical properties of the railways, as the result of seriously restricted expenditures during the depression years, were inadequate at the beginning of 1941, and that even though expenditures were increased during the last year, they were still far below the average level of such expenditures in the years 1925 to 1929, inclusive, and were little more than adequate to offset the wear and tear on the fixed facilities resulting from the increased traffic of the last 12 months.

In the interests of greater efficiency and economy, the railways consolidated many of their facilities during the depression years and leaned heavily upon the strength and stability that had been built into their tracks and structures in an earlier and more prosperous era. As the result, in spite of the somewhat expanded facilities and increased expenditures for maintenance of way and structures during the last few years, there is still much that must be done in the year ahead to meet the enlarged demands that will be made for transportation—transportation which only the railways can provide.

Whatever these demands may call for in enlarged, strengthened and better-maintained elements of the fixed properties of the railways must be met. This will require large programs of new track construction to serve cantonments and munition and defense plants, and increased facilities for the railways themselves, including tracks, bridges, buildings, fuel and water stations and a wide variety of yard and terminal facilities. In addition, it will call for increased programs of rail and tie renewals, ballasting, ballast cleaning and surfacing, bank and cut widening, and general improvements in roadbed drainage.

Is this estimate of the needs of the railways correct? The answer to this question lies as largely in an accurate review of the expenditures that the railways have made for additions and betterments and for maintenance of way and structures during the last decade as it does in a correct appraisal of the traffic demands which lie ahead. The bold facts relative to the last decade are that many elements of the fixed properties of the railways have not only not been improved, but have not kept pace with current demands. Concerning capital improvements specifically, the figures show that whereas the annual gross expenditures of the Class I railways of the country for additions and betterments of their fixed properties (not net additions) averaged $461,848,250 in the years 1923 to 1930, inclusive, annual expenditures for these same purchases in the 10 years 1931 to 1940, inclusive, averaged only $158,271,700, or only approximately one-third as much.

As these figures indicate, the railways, during the last

Maintenance Up in 1941 Increase Needed to Meet Demands

decade, have, of necessity, held in abeyance hundreds of projects that they would have undertaken normally in the interests of improved service and greater efficiency and economy. They also indicate clearly that, averaging approximately $303,500,000 less per year than in the years 1923 to 1930, the railways, without largely increased expenditures for capital improvements, cannot long continue to carry an increased traffic volume, that, already in our present emergency has exceeded the peak of 1929, as measured by ton-miles, not to mention their ability long to handle satisfactory the still further increased load that is certain to be thrust upon them by our war efforts in the months ahead.

The fact that the railways have been able to operate so successfully during recent years, increasing the speed of trains and over-all efficiency, in spite of the drastic curtailments in expenditures for capital improvements, ranks with the most outstanding industrial achievements of the last decade. It is true that until the last year, both passenger and freight traffic have been far below the 1925-1929 levels, which reduced the demands upon many elements of the fixed property, but offsetting this have been widespread changes in service and operating methods which have called for extensive changes in practically all classes of railway facilities, in addition to calling for many entirely new facilities.

The real explanation of the accomplishments of the railways in improved service during the last decade, with marked reductions in expenditures for new facilities, is found essentially in the effective consolidation of many facilities, the abandonment of little-used or outmoded facilities, more economical design and more effective methods of construction, and, of no small importance, the ingenuity of railway officers and employees in adopting temporary or make-shift methods, at little or no out-of-pocket cost, to meet newly-developed conditions. To the extent that these measures will keep capital expenditures to a minimum in the year ahead, it is certain that they will be continued, but the fact that there is a limit to the economies possible through such measures, especially in the face of expanding service demands, must be recognized.

War Demands Call for "High-Speed Track"

To meet successfully the large demands in prospect calls for high-speed freight and passenger service. This, in turn, demands "high-speed track," with the requisite degree of built-in safety. As has been impressed on railway engineering and maintenance officers in recent years, high-speed operation affects, either directly or indirectly, almost every element of the track structure as to both design and construction. Light curvature is the most apparent essential to high-speed operation, and while considerable sums of money have been expended for curve reduction work by a few roads that are operating streamlined passenger trains and expedited freight service, even these roads are holding large programs in abeyance awaiting the funds necessary to carry them out, while other roads, with equally modern trains and traffic, have made little or no progress. To the extent that this situation prevails, the traffic of the railways is retarded, and the question may well arise as to the extent to which this can be tolerated longer in the light of the needs of the moment for expedited train service and over-all track capacity.

But beyond the item of track curvature, higher speeds call for longer turnouts at many critical points to avoid serious speed restrictions, and a stronger track structure, including heavier rail, stronger fastenings, a better tie condition, a deeper clean ballast section, and a better-drained roadbed. Recognizing this latter fact, the railways in recent years have allotted a disproportionate amount of the money available for maintenance to build the required stability into their main tracks, a fact that, while accomplishing the end in view, has in no small way affected adversely the adequacy of other units of fixed property, such as buildings and branch line facilities generally. But in spite of this favoring of main tracks, there are roads that are still unprepared to handle the traffic confronting them at high speeds, as is indicated by the fact that today, on some roads, streamlined passenger trains and important freight trains are being operated over old 80- and 90-lb. rail in track ballasted

The Railways Are Asking for 1,500,000 Tons of New Rail in 1942, the Largest Amount Since 1930, to Insure the Safety of Train Operation

with sand and cinders, and, accordingly, at speeds far below the potentialities of the equipment.

And the very fact that most branch and secondary lines have necessarily been neglected is now proving embarrassing in many instances, as many of these lines, through the construction of army camps, ordnance plants and defense industries, and a higher level of business generally, are being called upon for expedited train service, with maximum safety, beyond their ability to provide it. Thus, as regards secondary lines alone, much faces the railways in the days ahead, because to continue the neglect of such lines is to tolerate out-moded transportation service, if not factors much more serious at the moment.

Yard and Terminal Facilities

While a track structure adequate to the needs of high-speed operation is desirable, if, indeed, it is not essential to the expedited rail transportation that will be demanded in the days ahead, it is only one of the factors necessary to this end, because it is readily evident that it is of little advantage to speed trains between points of origin and destination, only to have them delayed in passing through yards and terminals and by inadequate servicing facilities enroute. Thus, to a greater extent than ever before, there is widespread need for revised yard layouts, new and revised humps and car retarder installations, power-operated switches, floodlights for safer and more expeditious night operation, and modern communication systems.

At the same time, the growing use of Diesel power in extended services is calling for completely new and different inspection, repair and servicing facilities at many points to permit the adequate maintenance and rapid conditioning of these units in intensive turn-around schedules. While many of those roads which have purchased Diesel power have provided adequate facilities for its maintenance and servicing, many others have not yet done so but have adopted temporary or make-shift arrangements in the interest of reduced out-of-pocket expense. To this backlog of needed improvements that must be undertaken in the interest of efficiency and ultimate economy, if not adequate service, must be added the additional improvements and changes that will be called for in this respect at many points during 1942 as new Diesel equipment is purchased and Diesel service is extended.

Adequate Fuel and Water Facilities Required

In addition to the improvements already mentioned as necessary to expedited train service, no less essential are adequate and properly-located fuel and water stations, facilities that have taken on increased significance with longer engine runs and accelerated train operation, and which promise to assume still greater importance as modern operating methods are still further extended under the impact of our war needs for transportation. As these improved operating methods have been adopted, road after road has availed itself of the marked improvements that have been made in locomotive servicing facilities in recent years, and, in addition, wherever possible under prevailing physical and financial conditions, has grouped water, coal, sand and cinder-handling facilities so that all of these services can be given to locomotives simultaneously, reducing delays both on the line and at terminals—but there is much in this direction still to be done.

As regards water service, with its vital effect upon both steam and Diesel train operation, dependability of supply, quality of water and economy have been receiving largely increased attention in recent years. It is now generally recognized that with proper boiler water, locomotive failures are minimized, routine boiler maintenance is reduced, and locomotive performance is improved generally. In fact, without the scientific treatment of bad boiler waters, the railroads would have been blocked in their efforts to increase the length of engine runs and to make the intensive use of their power that they are doing today. But here again there is still much to be done, as many roads come to realize more fully that the key to many of their operating problems lies in better boiler water, and that under today's intensive operations, it may be desirable and economical to treat waters that formerly, under less intensive train operation, were considered suitable for boiler use in their natural state.

Along with improvements in the quality of boiler water, modern train operation demands a dependable supply of water and more rapid delivery to locomotive tenders, and to this end many roads are availing themselves of larger storage and service tanks, modern automatically-operated pumping equipment, and water columns of larger capacity. These improvements, of necessity, must continue, in either peace-time or war, to meet the requirements of modern train operation.

Bridges and Buildings Need Attention

Railway bridges generally, like main-line tracks, represent generally the highest standard of condition among the various elements of fixed property of the railways, figuring so prominently, as they do, in the safety of train operation. However, the fact that even many of these structures have suffered neglect during the depression, and require strengthening under the greater impact of high-speed trains, is evidenced by the action of road after road during the last two or three years in raising the ratings of bridges on entire territories to accommodate heavier power operated at higher speeds. In part, welding for the repair and strengthening of steel structures has come to the rescue and is assuming increasing importance. That this method will assume still greater importance in the future as many bridge-strengthening programs become imperative on branch lines subject to more intensive use and heavier loadings, is a certainty.

Railway buildings, unfortunately, are in a less favorable position than bridges, and, in general, than any other element of the railways' fixed properties. Almost continuously throughout the depression, such funds as were available for additions and betterments and, likewise, for maintenance, were directed largely to the track structure, to bridges and to those other facilities that directly affect the safety and character of train operation. Buildings became the "step child" of railway facilities, and even though changes in operating methods, changes in the size and type of power, changes in terminal points and, not infrequently, demands on the part of patrons and communities called for extensive improvements, buildings continued to be given secondary consideration.

As a result of this situation, and in spite of somewhat increased expenditures for improvements to shop, terminal and on-line buildings during the last two years, including the modernization of a considerable number of passenger stations, there is a vast amount of work of this character still to be done, much of which takes on increased importance in view of our involvement in the war. Fortunately, without encroaching on defense labor or utilizing materials essential to defense, much of this work, including the improvement of many passenger sta-

tions, can go forward during the year ahead, and should go forward to meet demands, improve service and effect over-all economy.

Will Meet Demands, If——

Are the fixed properties of the railways in a strong position to face the strain of war-time transportation in 1942? The answer to this question depends largely upon the magnitude of the strain that will come. By devious methods and means the railways stretched their existing plants to meet the needs of 1941, and met these needs successfully. However, if increased traffic and demands for new or altered services come in the year ahead, which seems inevitable, it is obvious that improvements in and additions to present facilities must be made to keep pace. In the event that the betterment and expansion of facilities becomes essential, the railways will need additional capital, which can be secured only through adequate net earnings and added investment in them by the public. They will also need materials, of both a defense and non-defense nature. With the necessary funds and materials, plus a continuation of the ingenuity for which railway men have always been noted, the railways can and will improve their properties during the year ahead to meet any demands that may come.

Must Raise Standard of Maintenance

Beyond the need for capital improvements in their properties, the railways in 1942 will be faced with the urgent need for raising the standard of maintenance of their properties. Many miles of high-speed main line tracks are maintained today to standards of strength and stability never before attained, but as a whole, after more than 10 years of greatly restricted earnings and seriously curtailed expenditures, the standard of maintenance of the tracks and structures of the railways is definitely lower than it was at the close of the Twenties. This situation prevails in spite of appreciably increased expenditures for practically all classes of maintenance work during the last few years, as compared with those made during the depths of the depression.

Relatively, 1941 was a big year in maintenance for the railways. On the basis of actual expenditures for the maintenance of roadway and structures during the first 10 months of the year, which are all that are available as this article is written, it is estimated that expenditures for the year as a whole were in excess of $590,000,000, which is greater than those for similar purposes in any year since 1930. These increased expenditures in 1941 had an important influence in raising the standards of maintenance of the track and structures generally, but the true picture of the condition of the different elements of the fixed properties of the railways can be seen only by a comparison of the expenditures that have been made for their maintenance during the last 11 years, with those for the years immediately preceding the depression. During the five years ending with 1929, these expenditures by the Class I railways of the United States (including switching and terminal companies) averaged $849,020,923 annually, whereas, in the 11 years from 1931 to 1941, inclusive, the annual expenditures of these same roads for the same purposes averaged only approximately $444,300,000, or little more than one-half as much.

Breakdown of Maintenance Expenditures

Just how this large deficiency in maintenance is distributed among the various elements of the fixed property is indicated in one of the accompanying tables, which gives, for the major elements, a comparison of expenditures for maintenance in the years 1932 to 1940, inclusive, with those in the years 1925 to 1929, inclusive.

Looking first at the expenditures for roadway maintenance, it is seen that average annual expenditures for the years 1932 to 1940, inclusive, were only $35,623,000, as compared with average annual expenditures of $83,698,000 in the earlier five-year period, a reduction of approximately 57 per cent. In the case of bridges and culverts, the corresponding average annual expenditures for the period 1932 to 1940, inclusive, and 1925 to 1929, inclusive, were $22,849,000 and $43,471,000, a reduction of approximately 47 per cent; for ties, the corresponding average annual expenditures were $53,844,000 and $114,859,000, a reduction of approximately 53 per cent; for rail, the corresponding average annual expenditures were $18,180,000 and $47,402,000 a reduction of approximately 62 per cent; for track laying and surfacing, the corresponding average annual expenditures were $100,387,000 and $211,067,000, a reduction of 57 per cent; for buildings, the corresponding average annual expenditures were $36,132,000 and $79,000,000, a reduction of approximately 54 per cent; and for water supply, the corresponding average annual expenditures were $4,953,-

Expenditures for Maintenance of Way and Structures, Class I Railways

(Thousands)

	Average 1925-1929 (Inclusive)	1932	1933	1934	1935	1936	1937	1938	1939	1940
Superintendence	$57,262	$36,552	$31,921	$33,347	$35,605	$37,357	$39,801	$38,935	$39,072	$40,230,719
Roadway Maintenance	83,698	32,042	30,026	30,714	35,809	38,289	42,017	37,219	36,112	38,371,803
Tunnels	2,608	1,466	933	1,051	1,453	1,326	1,709	1,256	1,210	1,373,676
Bridges, Culverts, etc.	43,471	19,434	17,627	20,139	22,646	24,032	26,268	24,200	24,782	26,513,879
Ties	114,859	50,294	43,543	50,748	51,936	56,315	59,799	53,762	59,910	58,353,077
Rails	47,402	13,762	14,324	15,418	16,302	21,192	20,412	17,406	22,065	22,735,542
Other Track Materials	48,354	15,726	15,362	18,694	20,959	26,732	30,228	22,817	29,670	33,428,312
Ballast	19,379	4,969	5,814	7,538	8,357	11,992	12,362	7,744	10,343	11,592,186
Track Laying and Surfacing	211,067	83,407	77,025	85,641	94,033	106,072	121,113	103,420	114,932	117,839,034
Fences and Snow Sheds	5,831	2,135	2,047	2,412	2,260	†3,397	†3,689	†2,939	†3,235	3,407,580
Crossings and Signs	13,115	6,468	5,969	7,293	7,186	*	*	*	*	*
Buildings	79,000	24,924	24,576	31,448	33,047	41,252	47,757	34,315	41,018	46,851,931
Water Supply	10,444	3,952	3,749	4,441	4,497	5,860	6,182	4,672	5,207	6,019,647
Tools and Equipment	18,230	7,917	8,051	10,666	11,044	13,452	15,408	11,456	13,720	15,433,560
Injuries	5,907	2,811	2,417	2,810	2,727	3,118	3,303	2,806	2,929	3,219,767
Removing Snow, Ice and Sand	9,947	4,699	4,188	5,630	7,001	13,365	6,655	5,239	6,110	9,029,877
Miscellaneous	78,449	40,621	34,714	37,310	39,105	51,059	58,891	51,961	56,516	29,202,370
	$849,021	$351,179	$322,286	$365,300	$393,967	$454,810	$495,594	$420,147	$466,831	$497,031,272

Note: Miscellaneous includes signals and interlocking, all charges for depreciation and unclassified items.
* Not shown separately since 1935.
† Includes signs, as well as fences and snow sheds.

000 and $10,444,000, a reduction of approximately 53 per cent.

Further light is thrown on the rail and tie situation by the other accompanying tables. From the table of rail renewals, it is to be noted that while the amount of new rail laid in replacements in 1941, estimated at 1,200,000 gross tons on the basis of figures made available to the *Railway Age* by the railways, is larger than was laid in any year since 1930, it was still only a little more than half the amount laid in any one of the years 1925 to 1928, inclusive, and approximately 758,000 tons less than the amount laid in 1929.

From the similar table relative to tie renewals, it is seen that the Class I roads inserted approximately 45,500,000 ties in 1941. This was a larger number of ties than were inserted in the tracks in 1938, 1939 or 1940, but it was 1,861,000 and 2,230,000 ties fewer than were installed in the tracks in 1936 and 1937, respectively, and only slightly more than 56 per cent as many ties as were inserted in tracks annually between 1925 and 1929, inclusive, when tie renewals averaged 78,770,446.

Rail Applied in Renewals—Class I Roads

	Gross Tons		Gross Tons
1925	1,950,146	1933	403,254
1926	2,209,873	1934	631,093
1927	2,124,765	1935	582,794
1928	2,080,277	1936	921,298
1929	1,958,489	1937	1,029,861
1930	1,517,002	1938	599,752
1931	984,900	1939	878,642
1932	394,536	1940	998,914
		1941	1,200,000*

* Estimated.

There is no question but that the foregoing figures, in themselves, indicate an exaggerated accumulation of deferred or under-maintenance of the tracks and structures of the railways, because they do not take into consideration many factors vitally important to a true appraisal of conditions, including the reduced volume of traffic during the depression years, with the resulting reduced wear and tear of the tracks during this period, and the marked advances that have been made in increasing the life of materials and in increased efficiency in carrying out maintenance work. But giving full consideration to all of these factors, it must be concluded that there is still a sizable accrued deficiency in maintenance all along the line, a fact that is borne out by observation of conditions on a number of roads.

As regards tracks, this situation is particularly noticeable in the condition of branch and other secondary lines, as well as yards, but it applies as well to many miles of main tracks, in spite of the preferred attention that has been given to these latter tracks throughout the depression. Obviously, therefore, if all classes of railway tracks are to carry the increased traffic forecast for the present year under our expanding war effort, with safety, and at the increased speeds that will be desirable, if not essential, it will be necessary that expenditures for maintenance during the year be stepped up appreciably over what they have been for many years in the past.

Work Equipment to the Rescue

That the fixed properties of the railways have held their own as well as they have in the light of drastically reduced expenditures for maintenance is due in large measure, as has already been pointed out, to the marked advances that have been made in extending the life of materials and to the increased efficiency that has been developed in work operations. While these two factors embody many subordinate factors, all of which have contributed to a greater or smaller degree, possibly the outstanding factors in this regard have been improved methods of carrying out maintenance work and the widespread use of power tools and equipment as an aid to more permanent and less costly work.

From little more than a start in 1925 in the use of modern power tools and equipment as they are known today, the railways now have an investment of well over $110,000,000 in such tools and equipment, having expended more than $20,000,000 in the years 1937 to 1940 alone for approximately 13,500 units, and having added to this to the extent of at least another 8,000 units in 1941, at an additional cost of approximately $10,500,000, in the largest expansion in equipment that they have made in any one year to date. Without thus resorting to the aid of power equipment, with the fundamental changes that it has brought about in more economical gang organization and methods of doing work as a whole, as well as in producing a higher standard of work, railway track standards would be far from what they are today. In fact, it is felt generally among maintenance of way men that without this equipment, the track structure would be the outstanding limiting factor in rail transportation at the present time.

To the extent that this is true, it is desirable that the use of mechanical aids for maintenance work be extended in the year ahead to those roads that have not seen the necessity of its use to date, and that even those roads that have made the most extensive use of such equipment in the past, further intensify the use of their present equipment to the greatest extent possible and secure such additional units as may be necessary to insure maximum production, the highest standards of work, and the greatest possible economy. Only by so doing can maintenance officers hope to hold their own in the face of the heavy demands that unquestionably lie ahead, not to mention taking up some of the slack that exists in maintenance generally.

Crossties Applied in Renewals—Class I Roads

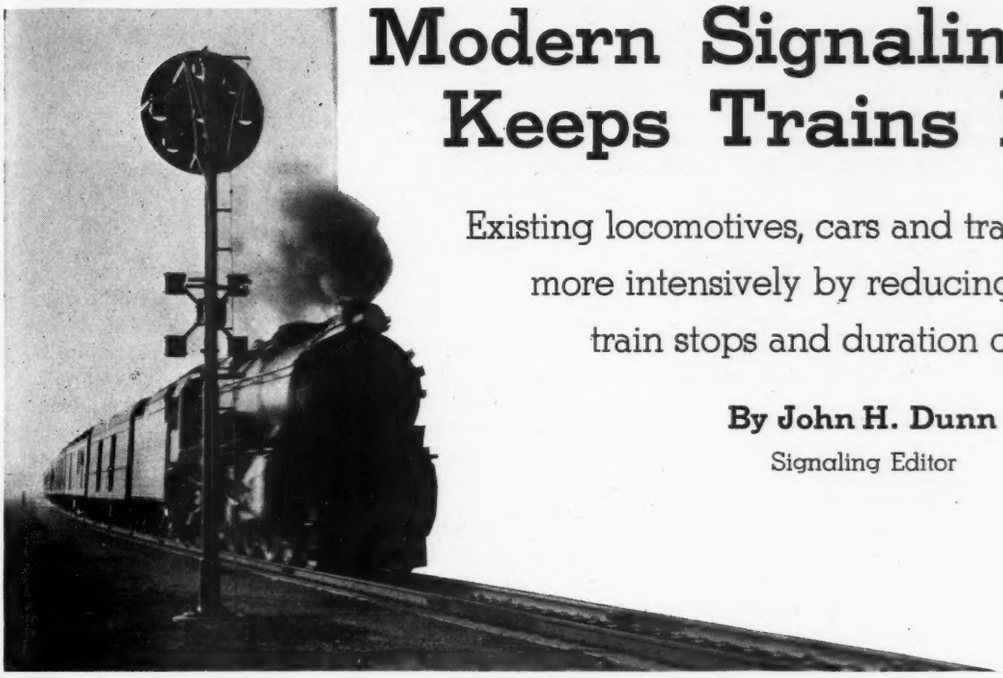
1925	82,716,674	1933	37,295,716
1926	80,745,509	1934	43,306,205
1927	78,340,182	1935	44,351,900
1928	77,370,491	1936	47,361,015
1929	74,679,375	1937	47,729,538
1930	63,353,828	1938	41,363,224
1931	51,501,659	1939	45,088,278
1932	39,190,473	1940	43,620,653
		1941	45,500,000*

* Estimated.

Must Have Materials and Equipment

No one knows the extent that railway construction and maintenance programs will be increased in 1942, but it is a certainty that there must be a sharp upturn over even the increased programs of 1941 if the railways are to keep pace with the demands that are predicted. That the railways recognize this is evidenced by the fact that they have already estimated their minimum new rail requirements for 1942 at 1,500,000 tons, which approaches the tonnage laid in 1930, and are placing orders accordingly.

The construction and maintenance of way forces are ready to do their part to meet any demands that may come, but it must be recognized by railway managements, and especially by government authorities, that if the railways are to meet these demands successfully, their forces must not be robbed indiscriminately of their best men, and must be allowed to obtain the materials, tools and equipment necessary to the consummation of their work.



Modern Signaling Keeps Trains Moving

Existing locomotives, cars and tracks being used more intensively by reducing number of train stops and duration of delays

By John H. Dunn
Signaling Editor

Centralized Traffic Control Was Installed During 1941 on 456 Miles of Road

THE year 1941 brought numerous developments in and installations of signaling facilities to afford the means for increasing the amount of transportation which can be provided by existing cars, locomotives, tracks and yards. Additional main tracks, even if justified for future years, cannot readily be planned and constructed in time to be of much benefit during the present emergency. Such locomotives as can be built during the National Defense program are needed to move the larger volume of traffic in trains of greater tonnage and at higher speeds, thus holding down the number of trains on line.

Except for divisions on which the major traffic consists of solid trains of coal and similar heavy commodities, many roads are now sacrificing tonnage to gain speed. So far as possible, trains are being operated at the highest speeds consistent with the construction of the rolling stock and track. The solution for the current problem of providing more transportation is, therefore, to minimize delays in yards, start trains when they are ready to go, and keep them moving at maximum speed whenever a track is available, rather than tolerating unnecessary speed reductions, stops and time lost while waiting. An important point in this consideration is the fact that a comparatively small amount of equipment and labor were required on extended mileages during the last year to make the signaling changes necessary to secure the desired benefits in train operation and thereby contribute to the relief of shortages of motive power.

Under given conditions of tracks, motive power and tonnage to permit maximum speeds, several roads have proved in 1941 that the most effective means of getting trains over the road more quickly and of using fewer locomotives to create more net ton miles, is to install centralized traffic control. Such a system obviates the train stops and delays which are inherent when train movements are authorized by time-table and train orders because all movements are authorized by indications of semi-automatic signals so controlled that the man in charge of the control machine, who is kept currently informed of the exact location of each train, can advance a train whenever a section of track and period of time are available. Furthermore, by installing power switch machines that are controlled as a part of the C. T. C. so that trains need not be stopped to permit operation of hand-throw stands, a train will save about five minutes when entering and eight minutes when departing from a siding. Based on studies of existing installations, C. T. C. will reduce the overall time of a train from 1 to 1.5 minutes for each mile run.

In 1941, the railroads made marked progress in C. T. C., not only in the installation of major projects, but also in developments to simplify the system so that it will be applicable on extended mileages handling a medium volume of traffic on fast schedules. Since its start about 15 years ago, the railroads had installed C. T. C. on about 1,891 miles of road up to a year ago. For the most part, this was comprised of short mileages —bottlenecks here and there—ranging from 1 mile to approximately 40 miles, the outstanding exception being a complete engine district of 105 miles on the Burlington.

Starting in the summer of 1940, various roads planned new C. T. C. projects as well as extensions of previous installations to close gaps and thus create extended sections. Among these, the Pennsylvania added to a previous 30-mile section to provide a total of 102 miles of C. T. C. between Almeda, Ind., and Casey, Ill. Another project that was completed in October, 1941, extends between Richmond, Ind., and Cincinnati, 61 miles, and the job next proposed is to extend eastward from Indianapolis. The Denver & Rio Grande Western had previously installed C. T. C. on 14 miles of line eastward from Grand Junction, Colo. In September, 1941, a 27-mile installation was completed between Dotsero, Colo., and Chacra, and materials have been ordered to complete the gap and bring the total installation to 108 miles, which project, when completed, is expected to give this single track line 75 per cent of the efficiency of double track.

Among other installations of C. T. C., the Louisville & Nashville is equipping 107 miles, the Chicago, Milwaukee, St. Paul & Pacific 61 miles, and the Canadian

National 130 miles, while the Erie, the New York, Chicago & St. Louis, the Virginian, the Seaboard Air Line and other roads have projects under construction. In brief, the C. T. C. installed in 1941, together with that which is now under way or authorized, totals more than half as much as was in service at the beginning of 1941.

C. T. C. With or Without Power Switches

Previous installations of C. T. C. have, for the most part, included power switch machines at the junctions and passing tracks used regularly by through trains. A development, that was brought out prominently during 1941 by the Norfolk & Western, used either ordinary hand-throw switch stands, spring switch mechanisms, or power switch machines, depending on the requirements for train service at the respective switches, semi-automatic signals for authorizing train movements being included in the C. T. C. system. An installation of the same character is now being completed on the Chicago, Milwaukee, St. Paul & Pacific. This practice is leading to the thought on some railroads of changing automatic block to C. T. C., leaving the hand-throw switches in service except that power switches may be used at locations where grades are adverse for trains entering sidings.

With the object of minimizing materials, especially the apparatus required for the control of signals and switches from a central office, an arrangement developed in 1941 uses only six instead of eight semi-automatic office-controlled signals at a passing track on a single track, and these six signals are controlled as the equivalent of one remotely-controlled interlocking rather than two. Certain systems of automatic signaling now in service can be converted to the C. T. C. arrangement mentioned above by the addition only of a control machine, coding equipment, local relays and wiring at the passing tracks. Where a well-constructed telephone train dispatching circuit is in service, no additional line wires are required. Extensive changeovers from automatic block to C. T. C. are, therefore, practicable, and one road which had planned the installation of automatic signaling on 135 miles, is now considering C. T. C. on this basis. Thus C. T. C. has now been developed to the stage that it can now be justified economically on a large percentage of main lines, including even those which handle moderately heavy traffic on fast schedules.

Delays to Trains in Motion

Turning to the finer points which must be considered in the operation of high-speed trains, an item of increasing importance in these days is the unexpected delays incurred by trains while reducing speed and again accelerating to normal speed. These delays, each of perhaps only two to five minutes and caused by unanticipated variations from normal speed here and there, add up to a total on an overall run of several hundred miles that may determine the success or failure of dependable on-time performance of high-speed trains. Of late years, the schedules have become increasingly "tight," with little opportunity to "run out" delays. Modern signaling is being used to obviate or minimize these delays to trains in motion.

With certain outstanding exceptions, most of the older signaling was designed to tell an engineman only that (1) The track is clear, keep going, or (2) Reduce to medium speed (30 m. p. h.) as soon as practicable, and proceed prepared to stop at the next signal. To this must, of course, be added the aspect directing a train to stop, but advance information to this effect is given in item (2) above. As more of the railroads have studied means of minimizing delays to high-speed trains in motion, they have come to realize that signals displaying more than three aspects would help.

In such a system of three-aspect signaling, the signals must be spaced full train-stopping distance so that if an engineman encounters a signal displaying an Approach aspect, he can stop his train short of the next signal which is displaying the Stop aspect. The principal concern, therefore, when high-speed trains were introduced a few years ago, was to lengthen the automatic blocks. Some roads adopted 7,000 ft. as a minimum, others 8,000 ft. and one road 9,000 ft. Where local conditions, such as passing tracks, necessitate blocks shorter than train-stopping distance, controls have been changed to cause Approach aspect to be displayed on two successive signals in approach to one displaying the Stop aspect. Some roads have overlapped the controls so that a signal will display the Stop aspect not only while the block is occupied, but also while part of the second block is occupied. Long blocks, successive Approach aspects and overlapped controls do not affect train operation when the line is clear for an approaching train. As train interference has increased with the growth of traffic, however, the long blocks and other conditions mentioned above have become causes for delay, especially in the vicinity of junctions and passing tracks. As a result, more roads are realizing the need for signals displaying more than four aspects.

For example, a freight train may be taking siding and be nearly in the clear when a passenger train is approaching. With three-aspect signaling and 8,000-ft. blocks, the passenger train will encounter an Approach aspect 16,000 ft. from the passing track. Using a typical 788-ton light-weight passenger train hauled by a 212-ton locomotive on level track as an example, this train, after passing the Approach aspect, will reduce speed from perhaps 85 m. p. h. to 30 m. p. h. within the first 5,500 ft., and then proceed at that speed prepared to stop at the next signal. If the freight train clears the main line in the meantime, the next signal will be Clear. As a liberal example, if after running at 30 m. p. h. for 1,000 ft. the engineman sees the Clear aspect on the next signal when 1,000 ft. from it, he can then release the brakes and start accelerating. Under these circumstances the total time he will lose will be 5 min. as compared with running through at 85 m. p. h.

Where such circumstances are likely to occur frequently, some roads are installing three-block four-aspect signaling, increased attention to this development having been evidenced during the last year. With the four-aspect scheme, the signals are spaced one-half the total train-stopping distance, so that in the case cited above, there will be two signals 4,000 ft. and 8,000 ft. respectively in advance of the passing track. If the main line is cleared and the signal is also cleared soon after the train passes the 8,000-ft. signal, its speed would have been reduced to about 52 m. p. h. at the 4,000-ft. signal, and on the authority of the Clear aspect then displayed by that signal, the engineman can release the brakes and accelerate the train. The total time loss under these circumstances would be approximately 2 min. 30 sec., thus saving about 2 min. 30 sec., as compared with the operation involving three-aspect signals.

The principal benefit of four-aspect signaling, in-so-far as saving train time is concerned, is to afford opportunities at more frequent intervals for enginemen to encounter more favorable aspects sooner than with three-aspect signaling. The ultimate in this respect is provided by continuously-controlled cab signaling, as more favorable aspects are shown instantaneously in the locomotive cab.

Four-aspect signaling has been used for several years by various roads, including the New York Central, the Boston & Maine, the Chicago & North Western and the Atchison, Topeka & Santa Fe. Heretofore the four-aspect system has been based on the use of a second operative unit on each signal, and a major objection has been the expense of installing this additional unit, as well as the relays and circuits required. Another objection to the four-aspect system, as shown in the Standard Code, has been that each of the four aspects includes two arms or the equivalent in lamps, and some roads hesitate to adopt aspects which, in their opinion, may be confusing to enginemen who are accustomed to only the three single-lamp automatic block aspects—red, yellow and green. In October, 1941, the Illinois Central converted 60 three-aspect automatic signals to four-aspect by the simple means of flashing the yellow lamp as the fourth aspect.

Non-Stop Automatic Signals

For many years trains have lost time and in some instances encountered delays when observing the most restrictive indication of permissive automatic block signals, Code Rule 290, "Stop and then proceed at restricted speed." On ascending grades numerous roads have provided markers which authorize tonnage trains, when encountering such aspects, to pass the signal without stopping and proceed at restricted speed. Railroad men who favor omitting the stop at the signal have argued that observance of the restricted speed throughout the block depends on the alertness of the enginemen as well as on proper supervision of their action and that whether the engineman was required to stop at a signal should be of no consequence in the observance of the restricted speed rule. As fast as practicable, signals of this nature are being installed on all ascending grades of more than 0.5 per cent on the Union Pacific, several sections having been completed in 1941. Similarly, since 1930, the Illinois Central has permitted all trains to pass permissive automatic signals, when displaying the most restrictive aspect, without stopping. Other roads, which realized the benefits of omitting the train stop, contended that the practice of authorizing trains to pass a signal displaying a red light without stopping might be confusing to enginemen. Some roads, therefore, adopted the Restricting aspect, Rule 291. For example, the Union Pacific adopted an aspect of yellow in the main signal head, over yellow in a special marker on the mast, as the Restricting indication, Rule 290. This indication applies to all trains, both passenger and freight. With the thought of obviating the use of the Stop-and-Proceed aspect as well as special aspects such as those used on the Union Pacific, another railroad installed automatic block signals in 1941 with the most restrictiye aspect red-over-yellow, Rule 290, Proceed at Restricted Speed. This signaling applies without reference to whether the grade is ascending, descending or level.

Faster Operation of Freight Classification Yards

In addition to the use of signaling to get trains over the road in less time, power switch machines, car retarders and communication systems are being applied more generally in freight classification yards where they are saving from 40 min. to as much as 2 hr. for each car handled. Among the more recent installations, the yard at DeCoursey, Ky., on the Louisville & Nashville was equipped late in 1940 and a large yard is now under construction at Roanoke, Va., on the Norfolk & Western.

In addition to the constant improvements that are being made in track arrangements, switch machines and retarders, rapid strides were made during 1941 in providing additional means of communication in yards. The L. & N. project includes means for the humpmaster to give instructions by telephone to the engineman on the hump locomotive, with signals in the cab to indicate when new instructions are to be given, as well as to show that previous instructions are in effect and that the system is in operation. In addition to these features, the telephone system that is being installed in the Norfolk & Western yard will provide communication in either direction between the humpmaster and the engineman.

Modern Interlockings

Modern interlockings, as well as changes in previous plants are permitting routes to be lined up more quickly, thus saving train time. During 1941, the New York Central Lines installed two modern entrance-exit button control interlockings, one in Chicago and the other in Dunkirk, N. Y. Rather than using individual levers, the switches for a route are lined and the signal cleared by the operation of two buttons on panels. A change in lineup requires from three to five seconds, as compared with perhaps a minute or more with previous form of lever interlocking. The saving in train stops and delays, when train movements on various routes are numerous, is obvious. At some conventional lever-type power interlockings, changes have been made to permit full-stroke operation of each switch lever with one motion, rather than waiting until the switch operates and indicates. At large plants, this change permits a saving of a few seconds for each switch lever, and may total as much as 10 to 30 seconds, depending on the number of levers involved, when making a change in lineup. At numerous interlockings, semaphores are being replaced by light signals, one reason being to effect an instantaneous change of aspects rather than waiting several seconds for a motor to operate a semaphore blade from one position to another.

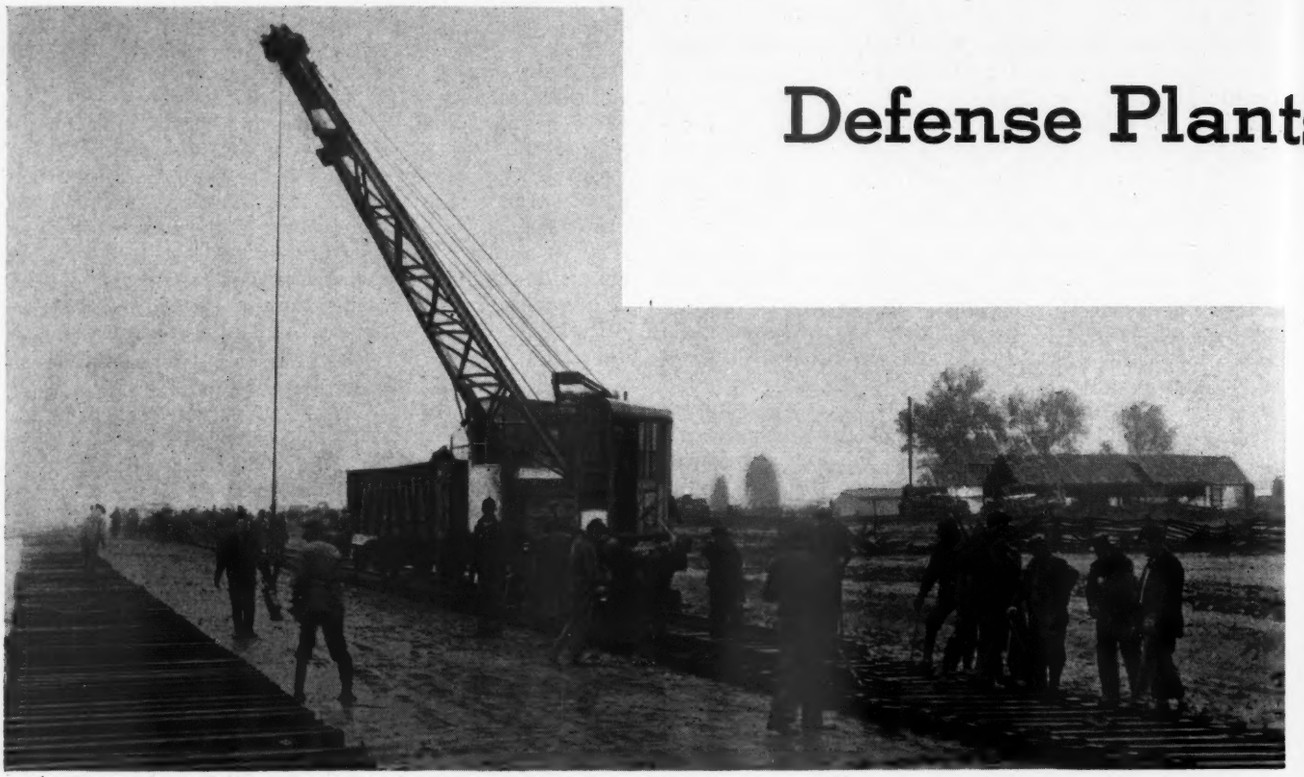
Developments in Grade Crossing Protection

In addition to the safety of the general public when using streets and highways which cross railroads at grade, study is being given also to the relation of grade crossing protection to the safety and speed of train movements. Through the years, thousands of crossings have been equipped with visible and audible types of signals to warn highway users of the approach of trains. In more recent years, the Federal and the State governments have shared this expense, but with the exception of one state, the railroads must pay the maintenance and operating expenses of this protection.

Much is being done to educate motorists concerning the protection provided by signals. For example, the Erie has made colored motion pictures to illustrate the proper as well as improper observance of crossing protection, these pictures being the basis of lectures given in schools as well as at meetings of clubs for adults. In New England, some roads have stationed railroad police at certain crossings to note the license numbers of cars and trucks which took chances. These are reported to state officers who have the power to cancel the licenses for the cars as well as the drivers licenses. Discipline of this nature helps, but the trend is to install gates in addition to signals at crossings involving heavily-traveled highways and either multiple or single-track lines on which high-speed trains are operated. For example, in 1940, signals were installed at 1,177 crossings and gates

(*Continued on page 43*)

Defense Plants



The Urgent Need for Speed Required that Track-Laying Operations at Defense Plants be Carried Forward Without Regard to Weather

THERE is no better criterion of the importance of railroad transportation to the national defense than the amount of new railroad trackage that is being required as a direct result of the construction work that has been undertaken as a part of the defense program. Because of the diverse and ramified nature of the defense program, it is not possible to state the aggregate trackage requirements with a high degree of accuracy, but it is apparent that, exclusive of further expansion beyond present authorizations, they will total at least 2,500 miles, the equivalent of an entire railroad system of moderate size. Of this amount, approximately 2,000 miles have been completed, with the remainder consisting of trackage that is now under construction or which will be needed at projects that have been authorized but not yet started.

It should be mentioned here that the entire history of the national defense program has been, and continues to be, a story of continuous expansion, with existing and completed plants constantly being enlarged and with new establishments being projected, so that the total ultimate trackage requirements may be far in excess of the figures given here. In fact, if the huge "victory program" that is reported as being planned in Washington becomes a reality, it is possible that the future trackage requirements at defense plants will surpass those of the present phase of the program.

Projects Requiring Trackage

The construction phase of the national defense program has many ramifications, involves a wide diversity of undertakings, and is being prosecuted by a number of different government agencies; hence, there is a many-sided picture to be presented if an adequate conception is to be obtained of the nature and extent of the trackage requirements. Considering them without regard to classification or to the agency under which they are being prosecuted, the defense projects requiring the construction of railroad trackage include army camps and cantonments, army ordnance plants and depots, quartermaster supply depots, air fields, arsenals, proving grounds, navy yards, ship yards building cargo vessels, and the numerous industrial plants that are being built or expanded, largely with government funds, for the production of a wide diversity of material.

The amount of railroad trackage required at individual locations ranges from a fraction of a mile to as much as 100 miles or more, mileages in the latter category being relatively common at the larger ordnance plants. Types of trackage involved include connecting lines between adjacent railroads and the military establishments, side and platform tracks, connecting or running tracks within the confines of the plants if they are of the heavy manufacturing type (such as shell-loading plants), and classification yards. Indeed, in some of the large ordnance plants the railroad facilities provided have all the characteristics of independent railway lines, complete with managerial and maintenance staffs, motive power, rolling stock, automatic signalling systems, etc.

488 Projects in One Phase

The largest single phase of the emergency construction program is that which has been prosecuted by the construction division, office of the Quartermaster General.* In this part of the program, a total of 488 separate projects, having an aggregate cost of approximately $2,500,000,000, had been undertaken up to November 1, some of which have been completed, although others are still under construction and some are still in the planning

* It was announced on December 2 that all the construction activities that had heretofore been carried out by the Construction division, office of the Quartermaster General, would soon be transferred to the jurisdiction of the Corps of Engineers.

Call for Track Construction on a Major Scale

Projects completed or projected to date, with many more to come, will require the building of at least 2,500 miles of lines

By M. H. Dick
Eastern Engineering Editor

stage. Included are army camps and cantonments, and allied facilities; ordnance manufacturing establishments, such as bomb and shell-loading centers and plants for manufacturing chemicals and explosives; ordnance and quartermaster supply depots; and arsenals and proving grounds. Incidentally, construction progress on most of these undertakings is anywhere from two to four months ahead of schedule.

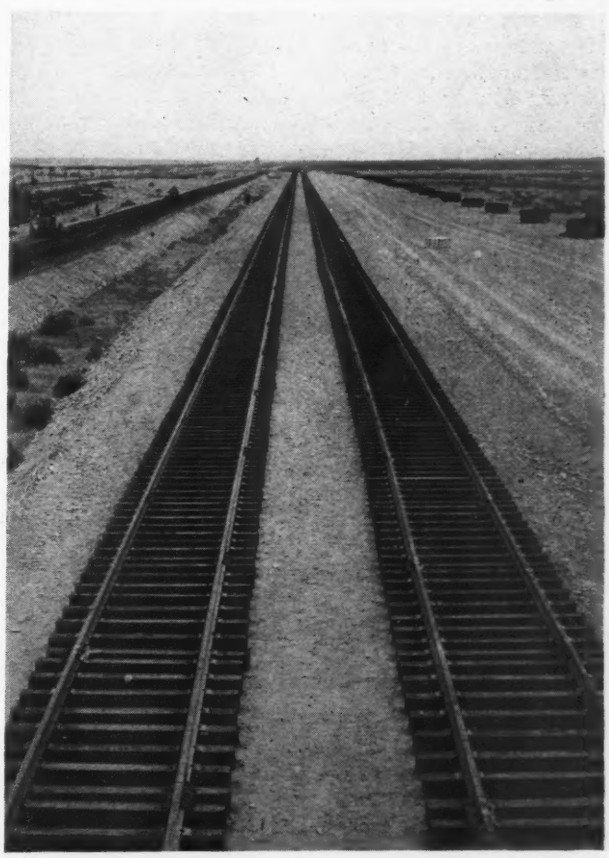
It is the ordnance plants that, individually, require the largest amount of trackage. This is true because the various storage and manufacturing units comprising such plants are usually scattered over relatively large areas of land, requiring considerable lengths of connecting trackage between them. To these requirements must be added the need for extensive classification and other types of yards at some of the larger plants. To date, a total of 60 ordnance manufacturing plants have been projected, of which 26 are in partial or complete operation. Up to the present time, 1,100 miles of trackage have been constructed at these plants, and with many miles of lines still uncompleted or yet to be undertaken, it is obvious that the total mileage will greatly exceed this figure.

Representative Ordnance Plants

A statement of the mileage that has been constructed at a number of representative ordnance plants will serve to convey some idea of the requirements at such establishments. On the basis of the amount of trackage required, the list of such plants is headed by the Ravenna ordnance plant and depot, Ravenna, Ohio, a shell and bomb-loading center, where approximately 120 miles of permanent tracks have been built. Other representative plants include the Elwood ordnance plant, Joliet, Ill., (shell-loading), with 100 miles of tracks; the Iowa ordnance plant, Burlington, Iowa, 96 miles; the Kingsbury ordnance works, La Porte county, Ind., (shell-loading), 76 miles; the Indiana ordnance works, near Louisville, Ky., (smokeless powder), 68 miles; and the Kankakee ordnance works, Joliet, Ill., 56 miles.

All other construction projects of the Quartermaster department, including camps, cantonments, quartermaster depots and similar undertakings, have required the construction of about 500 miles of tracks. A total of 50 major camps and cantonments have been built, which have a capacity for housing approximately 1,500,000 men. Also, the program has included the building of 47 reception centers, 25 replacement training centers, 44 housing projects at the locations of harbor defenses, and numerous miscellaneous undertakings, nearly all of which have required at least some railroad trackage. At the major army camps the railroad facilities required include not only the sidings necessary for the handling of troop trains and supplies, but also tracks where motorized army equipment, such as tanks, trucks and artillery, can be loaded onto railroad cars under its own power, utilizing special loading ramps.

The amount of railway trackage that is required at



This Partially Completed Double-Track Line Leads to a New Ordnance Depot. Presence of the Tie Stacks and Evidence of Grading Indicates that One or More Additional Tracks are Planned

the various camps and cantonments varies widely, although not always in accordance with the size of the facility. Fort Bragg, N. C., which houses the largest number of troops of any army camp at the present time, has 16.31 miles of tracks, and Camp Shelby, Miss., the second largest camp measured by the number of men housed, has only 6.3 miles. On the other hand, Camp Stewart, Ga., and Fort Leonard Wood*, Mo., both smaller than Fort Bragg and Camp Shelby, have 21.41 miles and 30.3 miles of trackage, respectively.

An important factor in determining the amount of trackage required at army camps is the length of the connecting line to the nearest railroad. For example, of the 30.3 miles of trackage that were built at Fort Leonard Wood, 20 miles were necessary to provide a connection with the St. Louis-San Francisco. Other representative army camps, together with the trackage required, are: Camp Blanding, Fla., 25 miles; Pine Camp, N. Y., 13.3 miles; Fort Jackson, S. C., 9.5 miles; and Camp Edwards, Mass., 8.43 miles.

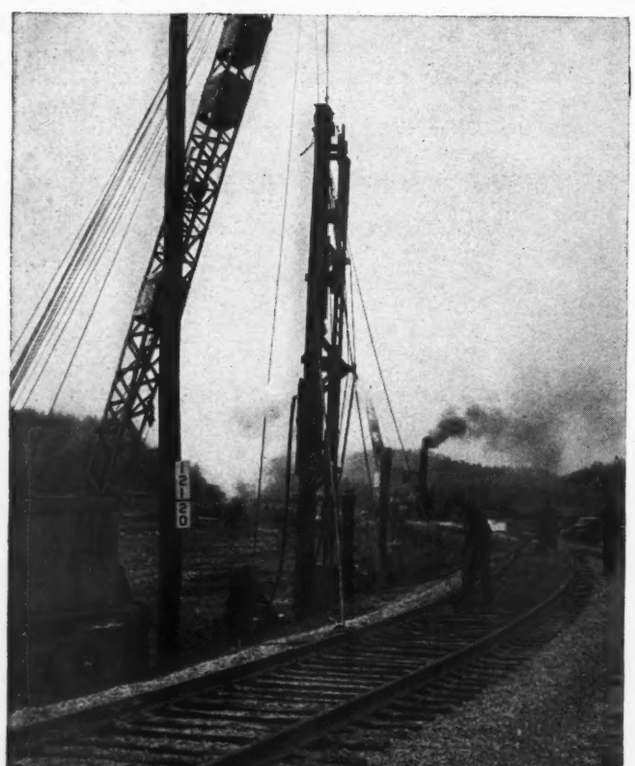
Other Projects Requiring Trackage

Varying amounts of new trackage have been constructed in connection with projects involving expansion and new construction at ordnance depots, quartermaster and general supply depots, proving grounds, and similar locations, most of this work also being under the supervision of the quartermaster general. Ordnance depots require considerable trackage. Some representative facilities of this type include the Ogden (Utah) ordnance depot, 28.29 miles; the Umatilla ordnance depot, Hermiston, Ore., 23.3 miles; the Seneca ordnance depot, Kendaia, N. Y., 18 miles and the Wingate (N. M.) ordnance depot, 13.74 miles. Trackage requirements at the new general supply depots that have been constructed throughout the country range from fractions of a mile to as much as 25 miles, while at individual quartermaster depots the amount of trackage required ranges up to 10 miles or more. Trackage constructed at proving grounds includes 13 miles at the Southwestern proving ground, Hope, Ark., and 12.5 miles at the Jefferson proving ground, Madison, Ind.

Among other defense establishments requiring considerable trackage is a new type of facility, known as a regulating station. Two installations of this type have been undertaken by the Quartermaster department, one at Voorheesville, N. Y., on the New York Central, and the other at Marietta, Pa., on the Pennsylvania. Each of these facilities consists essentially of a large collection of warehouses, with extensive platforms served by side tracks. A measure of the size of these undertakings is provided by the fact that the regulating station at Voorheesville contains 20.2 miles of tracks, while that at Marietta will have about 19 miles.

Certain types of defense construction projects requiring railway trackage have been carried out by the Corps of Engineers of the army. Prominent among these are numerous army air fields, of which approximately 150 have been or are being built. To date a total of about 120 miles of trackage has been built to serve the requirements of these fields. Expansion of the country's shipbuilding capacity for both naval and cargo-carrying vessels, has also entailed the construction of considerable railroad trackage. In fact, the laying of a total of about 60 miles of tracks has been required in connection with the construction by the Maritime Commission of nine new ship yards and extensions to others.

* Construction of a 20-mile line connecting this camp with the main line of the St. Louis-San Francisco was described in detail in an article published in the *Railway Age* of June 7, 1941.



Driving Piling to Stabilize the Roadbed for a Spur Leading to an Army Training Camp

Government-Financed Industrial Plants

A considerable mileage of new trackage is being required as the result of government-financed projects involving the construction or expansion of industrial plants to be used for the manufacture of equipment and supplies necessary to the national defense. Included in this category are plants for the manufacture of aircraft and parts, magnesium, aluminum, steel, synthetic rubber, machine tools, arms and explosives, cargo vessels, and numerous other materials and equipment. Funds for such projects are made available through the Defense Plant Corporation, a subsidiary of the Reconstruction Finance Corporation, by agreement with existing private concerns. A distinguishing feature of these projects is that the contracts for the construction work are generally awarded by the private concerns, whereas those for the other types of projects discussed in this article are awarded directly by government agencies.

A measure of the vastness of this phase of the defense program is given by the fact that to date a total of more than 350 individual projects have been undertaken, involving a total expenditure of approximately $2,000,000,000. While some of these projects involve merely the acquisition of machinery, the great majority of them envisage the construction of new plants, the largest, perhaps being a $90,000,000 steel plant at Provo, Utah. The amount of railroad trackage required at these new plants obviously will vary between wide limits, but it is estimated that it will average about 1½ miles for each project. Assuming that about 300 of these undertakings will involve the building of new plants, it follows that they will entail the construction of approximately 450

Some of the Larger Ordnance Plants Have Extensive Classification Yards Such as This One

miles of new tracks. It must be remembered that, along with other phases of the defense program, the particular types of projects mentioned here, with their trackage requirements, will be vastly augmented under the "victory program."

High Construction Standards

For the most part the tracks required by the defense program have been built to high standards of construction, the specifications generally calling for rail weighing at least 85 lb., treated ties, fully tie plated, the provision of anti-creepers where necessary, and the use of crushed stone, slag or other suitable types of ballast. Owing to the unprecedented nature of the requirements, which came at a time when the productive capacity of all industry was being strained to the utmost, the acquisition of materials necessary to carry out the track construction phase of the defense program has not been a simple matter, and some delays have occurred owing to the inability to obtain materials when needed. However, such obstacles appear to have been overcome in most instances without too much delay.

Materials from Railway Stores

In the track construction phase of the defense program, the railroads have played an important part, especially in providing large quantities of relay rail and the necessary fastenings. While a great deal of new rail has been used, many hundreds of miles of the new tracks have been laid with second-hand rail furnished by the railroads. An outstanding example of this was provided at the Ravenna ordnance plant where the tracks include approximately 100 miles of 100-lb. relay rail furnished by the Baltimore & Ohio.

Not only have the railroads constituted an important source of track materials, but they have also co-operated in making available experienced personnel without which the track construction program could have been carried out only with difficulty. For many years prior to the emergency, the new trackage requirements of the country had been at such a low ebb that there was no reservoir of skilled labor and supervisory personnel available except among the engineering and maintenance forces of the railroads. To fill this breach, many railroad engineers and other supervisory personnel, as well as laborers, have been drawn into the service of the government and of contractors, while at the same time the engineering departments of various railroads have acted in a consulting capacity on the design and construction of the track layouts.

Aside from the track construction made necessary, as described in the foregoing, as a result of defense projects undertaken directly by the government or financed through government agencies, there is no question but that the railroads themselves have found it necessary to build a large mileage of sidings and yard tracks, particularly in the vicinity of government projects, to permit them to handle the increased business resulting from the defense program. Also there is no doubt that numerous private concerns, finding their business greatly increased, both directly and indirectly as a result of the defense program, have carried out plant-expansion programs, using private funds, which have entailed the extension of railroad sidings serving their plants, although the aggregate amount of new trackage involved in projects of this type cannot be determined readily.

Modern Signaling Keeps Trains Moving

(*Continued from page 39*)

at about 160 crossings, whereas in 1941, signals were installed at approximately 707 crossings and gates at about 213 crossings.

To summarize, during 1941 the railroads made important strides in the development and installation of signaling facilities as a means of improving safety and expediting the operation of trains, and, except as retarded by the war, large signaling construction programs will be carried to completion in 1942. On account of the requirements of the National Defense program, supplies of certain materials, as, for example, insulated copper wires and cables for use in new signaling, were increasingly limited during the last half of 1941. For the duration of the war, therefore, new signal construction will probably be limited to those projects which are necessary to increase the capacity of certain lines to meet the requirements for transportation as a part of the war program, although it is to be expected that, for the same reason, provision will be made for the materials necessary for the proper maintenance and functioning of the signaling facilities already in service.

How Many Freight Cars for 1942?

The railroads face a probable increase of 10 per cent in total carloadings—A 9 per cent increase in cars on line on October 1 will provide considerable margin of safety

By C. B. Peck

Mechanical Department Editor

IN appraising the probable demand for freight cars during 1942 the situation is entirely changed from that prevailing during previous years. Then the matter had to be approached from the viewpoint of the interests of the railroads themselves. Now the interests of the individual railroad are of secondary importance, superseded in first place by the demands of the national war economy in which transportation plays a vital part.

The year 1941 has seen our national defense program stepped up from a business-as-usual basis until the demands of national defense, including the lend-lease program for supplying war materials to other democracies defending themselves against the totalitarian powers, have assumed first place and have rapidly been encroaching upon, and interfering with, the nation's normal commercial activities. With the additional pressure behind an all-out war program effected by the complete national unity of purpose created by the events of December 7, not only will the nation strain every nerve toward increasing the total volume of our national production, but the displacement of normal production and distribution in favor of the production of war materials will continue. From now on the entire national production and distribution system will be bent toward providing materials for our own armed forces and for the support of our military allies.

Ralph Budd, president, Chicago, Burlington & Quincy, and formerly transportation commissioner, Advisory Commission to the Council of National Defense, aptly describes our national production and distribution system as a "rather perfectly integrated" machine and compares the railroads to the belt conveyor system in a manufacturing plant. If the plant is expanded, obviously its internal transportation must be kept in balance with the expanded capacity of the more directly productive departments. If the inter-departmental movement of products in process of manufacture breaks down, or fails to develop capacity enough to meet the expanding demands placed on it by increased capacity in these other departments, then the output of the plant is going to be disappointing, and the expanded capacity in the departments devoted directly to the functions of production will have been provided to no avail.

How are we going to keep the railroads—the major factor in the movement of raw materials, semi-finished and finished products in the national production and distribution system—properly in step with the expanding demands on the rest of the system? There are several aspects of this problem besides rolling stock. However, the most direct relationship exists between the traffic volume and the number of freight cars and freight locomotives needed. This article will deal exclusively with the need for freight cars.

A Basis for Studying Freight-Car Utilization

In measuring the performance of freight cars in these articles from year to year two ratios have been used. These are cars on line per weekly car load and active cars per weekly car load. The weekly carloading used in computing these ratios is the average of the four highest weeks during the Fall peak each year. Active cars are computed by deducting from the number of cars on line as of October 1 the cars awaiting repairs and the minimum surplus cars reported during the Fall peak. From 1930 until 1939 these ratios were consistently higher than during the Fall peak of 1929, indicating a maximum utilization less intensive than for that year immediately preceding the business depression of the 1930's. During 1929 there were 1.88 cars on line per weekly carloading and 1.67 active cars per weekly carloading. During the Fall peak of 1929 the active cars were 89.5 per cent of the cars on line.

In 1936 and 1937 the utilization of active cars closely approached that attained in 1929, with a ratio of 1.7 in each of the two years. During both fall peaks, however, there were more than two cars on line for each car load. The high utilization ratio for active cars was because only 80 and 83 per cent, respectively, of the cars on line were active during these two Fall peaks. Then, in 1939, the ratio of active cars per weekly car load dropped to 1.62, representing the highest intensity of active freight-car utilization of record. Again, the ratio of cars on line per weekly car load was considerably higher than the 1929 low, principally because of the relatively large number of cars awaiting repairs—active cars amounted to 83.9 per cent of cars on line.

During the Fall of 1941 the peak loading averaged 916,000 cars during each of the highest four weeks, the largest Fall peak since 1930. During 1941 the record for intensity of utilization of cars on line was broken, the ratio being 1.81. This came about because of the lowest minimum surplus and the smallest number of cars awaiting repairs reported at any time during the period for which the utilization ratios have been computed. With 93.1 per cent of the cars on line active, the utilization ratio for active cars was 1.69—five points higher than in 1939.

So much for the performance during 1941. What of the coming year?

The first question which must be answered in attempting to arrive at an estimate of the needs for cars

during the coming year is how large will be the increase over 1941 in the national activities of production and distribution. There are several estimates of this increase which vary considerably in value. Expressed in terms of total car loads for the year, however, there is a growing body of opinion that this increase will not exceed 10 per cent. Having consideration for the trend in carloadings, empty car mileage, and average haul during recent years, it is probable that a 10 per cent increase in the annual carloadings will represent not less than 14 per cent increase in net ton-miles.

There seems little reason at the present time to give credence to the probability of an increase in the industrial activity of the nation for the year in excess of these figures. Limits on the availability of materials, man power, and the machinery of production have already necessitated the beginning of the process of transferring activity from normal commercial production to the production of war materials and machines.

One factor appreciably retarding our national output during 1941 it is to be hoped will not be effective in 1942; that is, strikes. Offsetting this, at least to some extent, however, may be the dislocation of man power growing out of the slowing down and discontinuance of normal production in many fields. On the other hand, there is the possibility of lengthening the work week. This will increase the output of existing plant capacity; just as effectively will it increase carloading capacity by reducing idle days of cars in the hands of shippers. Such factors are, of course, impossible of complete evaluation, but indicate that some of the higher prognostications are based upon wishful thinking more than upon the probabilities, at least, in so far as they affect the freight-car situation.

Carloadings for the year 1941 aggregated 42,345,000*. Assuming, then a 10 per cent increase for the year 1942, the railroads will have to provide for total loadings of 46,600,000 cars. Depending somewhat upon the distribution of this total volume of business through the year, the average loadings for the four highest consecutive weeks during the Fall may be expected to fall somewhere between 998,000 and 1,008,000. The latter figure represents a maximum since it represents a 10 per cent increase over this year's peak. It seems probable that a slightly larger proportion of the total year's business may be expected to fall within the first half of 1942 than was handled during the first half of 1941—a period during which American industry was being converted from business-as-usual to a state of all-out defense production.

* The last three weeks estimated.

Should this be the case, then the lower peak figure more nearly represents the probabilities.

Car Supply Needed to Meet the Peak

To determine the number of freight cars which the railroads must have on line at the time of the 1942 Fall peak movement, two factors must be chosen. The first is the ratio of active cars per weekly car load. Until 1939 the record utilization stood at 1.67; then it was reduced to 1.62. Assuming that the latter ratio can again be attained under the conditions now prevailing, next year's peak movement could be handled by an active car supply of about 1,635,000 cars. If all but 114,000 of the cars on line are active, as was the case during last Fall's peak, then an ownership of about 1,750,000 cars on line would be adequate to meet the peak demands.

If, however, the former record of 1.67 active cars per weekly car load were assumed for next Fall's peak, then an active car supply of about 1,685,000 cars would be called for and again assuming the same number of idle cars, a total of about 1,800,000 cars on line would be required. These estimates, then, indicate the need for a minimum of about 90,000, or a maximum of about 140,000 more cars on line on October 1, 1942, than were actually available on October 1, 1941.

Undoubtedly, it would be too much to say that a ratio of 1.62 active cars per weekly car load cannot again be attained during the four Fall peak weeks. It must be remembered, however, that during most of the years included in this study the Fall peaks have been adequately covered by a four week's period and that, even then, the highest week during the period usually rose considerably above the average. During 1941, on the other hand, the average for the highest four weeks varied but slightly from the average of the eight highest weeks (916,000 as compared with 912,000). This sustained period of maximum carloadings represents a considerably greater strain on car resources than does the shorter period.

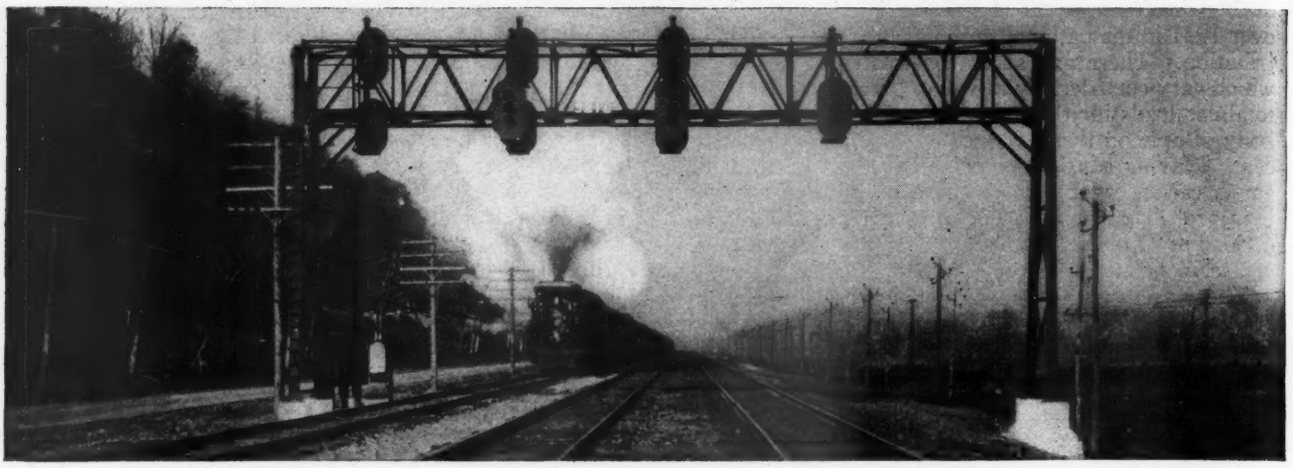
In estimating the needs of the railroads, therefore, it seems unwise to set as the maximum goal for the year ending October 1, 1942, a number of cars which will just meet the situation, assuming the highest utilization ever attained during a four weeks' period. With such a goal the resiliency of the railways in meeting emergencies would have to be relied upon heavily and the margin of safety would be dangerously narrowed should some of the more optimistic estimates of national productivity during 1942 prove to have been correct. Fur-

(*Continued on page 48*)

Trends in Freight-Car Supply and Freight-Car Utilization

											1942 Estimates			
											Carloadings in first half 46.9 per cent of year		Carloadings in first half 47.5 per cent of year (same as 1941)	
	1929	1930	1934	1935	1936	1937	1938	1939	1940	1941				
(1) Peak loading (000)*	1,186	960	641	721	820	829	711	839	817	916	998	998	1,008	1,008
(2) Total carloads for the year (000)	52,828	45,887	30,846	31,518	36,109	37,670	30,457	34,103	36,350	42,345	46,600	46,600	46,600	46,600
(3) Cars on line (Oct. 1) (000)	2,223	2,226	1,908	1,834	1,743	1,705	1,673	1,616	1,610	1,658	1,731	1,781	1,747	1,797
(4) Surpluses, min. (000)	107	389	318	208	112	102	139	64	75	41	41	41	41	41
(5) Awaiting repairs (Oct. 1) (000)	133	157	296	284	242	188	231	195	131	73	73	73	73	73
(6) Active cars (000)	1,983	1,680	1,294	1,342	1,389	1,415	1,303	1,357	1,404	1,544	1,617	1,667	1,633	1,683
(7) Cars on line per weekly car load	1.88	2.32	2.98	2.55	2.13	2.06	2.35	1.93	1.97	1.81	1.75	1.78	1.74	1.80
(8) Active cars per weekly car load	1.67	1.75	2.02	1.86	1.70	1.70	1.83	1.62	1.72	1.69	1.62	1.67	1.62	1.67
(9) Active cars per cent of cars on line	89.5	75.5	68.0	73.4	80.0	83.0	78.0	83.9	87.4	93.1	93.4	93.6	93.5	93.6
(10) Period of car shortages	9/23—10/31†	None	None	None	9/30—12/30	1/1 — 7/31	None	9/15—10/31	None	None	None	.....	.....	.....
(11) Max. shortages reported	.....	.....	.....	.....	836	3,035	.....	721	.....	.....	.....	.....	.....	.....

*Average of four highest consecutive weeks.
†Small shortages, each aggregating fewer than 100 cars, were reported during a number of weeks earlier in the year.
Note: All of the data in this table are taken from A.A.R. Car Service Division Reports. Items 1 and 2 are from Form CS-54A. Items 3, 5 and 6 are from Form CS-60A. Items 4, 10 and 11 are from Form CS-44A. Items 7, 8 and 9 are calculated.



Has Capacity of Motive Power Reached the Limit?

October peak traffic of 1941 absorbed the reserve and forced utilization to new high records — New power now a vital necessity for protection

By H. C. Wilcox

Associate Editor

THE best way to find out what can be done is to try it. Plans may be made and estimates of performances may be carefully worked out, making allowances for all known conditions, but the final test is the test of service. When that has been successfully passed it is reasonable to assume that a machine is functioning as it should.

For 10 years the railroads of this country have been waiting for a sufficient volume of traffic to create an opportunity to apply the service test to the type of operation that had, of necessity, to be developed during a depression and in the face of increasingly stiff competition. During 1940 we thought that the test had been successfully completed but it remained for 1941 to produce the operating trial that showed what our railroad plant and organization is really made of. As we look ahead to 1942 and 1943 it is with confidence born of the knowledge that if an intelligent equipment program is carried out the primary transportation facility of this country can function as it never has before. In this article the part played by motive power will be discussed in its relation to the performances of recent years only because they provide the experience upon which a sound program for the future may be built. For purposes of discussion it may be well to assume that the extent of utilization of freight motive power during the October traffic peak of 1941 may have approached the ultimate limit of capacity and that explorations of possible utilization beyond that point may reveal the most important immediate steps to be taken to assure continued high-capacity operation during times of national emergency.

There are certain basic facts with respect to freight service motive power that are worth keeping in mind. Probably the most important of these facts is that in no single year since 1930 has the building of new freight locomotives been sufficient to maintain a reserve of locomotives of the type that can meet the peaks of unusual traffic requirements with efficiency and economy. There has been no real shortage of motive power for the October peak operations in any of these years simply because traffic was far below normal but the experiences of 1939, 1940 and 1941 tell a different story. Reference to Column 8 of Table I will show that from 1931 to 1935, traffic, as represented in this case by gross ton-miles, handled during the month of October, was from 22 to 31 per cent below 1929; in the 1936 to 1938 period from 11 to 18 per cent below 1929 and in 1939 and 1940 only 5 per cent below 1929. At the same time it is of interest to see what is happening to the locomotive inventory. In 1937, for example, 70 per cent of the steam locomotives of Class I roads were 21 or more years old while in 1941 this percentage is 67.6 but there are 2,059 fewer freight locomotives and 5,163 fewer steam locomotives so that today 26,683 of the 39,461 steam locomotives are 21 or more years old whereas five years ago only 24,393 or 55 per cent, of the 44,162 steam locomotives were of that age.

The October freight performance statistics in Table I show that some outstanding records were made in 1941. With the freight locomotive inventory at an all-time low the number of unserviceable locomotives reached the lowest point in the 19-year period from 1923 to 1941. Except for 1939 when there were 1,077 locomotives more than in 1941 the number stored serviceable dropped to

a record low. In 1939 there were 2,895 more locomotives out of service for, or awaiting, repairs than in 1941 and in this latter year there were 2,809 more active locomotives than in 1939.

Here, then, is an excellent picture of the manner in which traffic demands affect motive power requirements. In this two-year period while the whole inventory was being reduced by a total of 1,656 steam locomotives less than 300 units were built new so that in 1940, in anticipation of greatly increased operations, the roads started putting "everything that would run" through the shop so that in 1941 it may be safe to assume that the increase of 2,809 locomotives in active service represented approximately what was "taken from the bone-yard."

To continue the analysis of Table I it is of incidental interest to call attention to the continuing decrease in aggregate tractive force. While locomotive-miles (Col. 7) are at the highest point since, but not as high as 1923-1929, Col. 10 shows that the roads actually ran each active locomotive many more miles in a four-week peak period than at any time in 19 years, exceeding 1929 by 552 miles per locomotive. Gross ton-miles (Col. 8) hit a new high, as did gross-ton-miles per 1,000 lb. tractive force (Col. 13) and per train-mile (Col. 14). The conclusions to be drawn from a study of 1941 operations are that, having fewer locomotives, it was necessary to use a greater proportion of them (Col. 5) and run them more miles in order to handle a volume of traffic, represented by gross ton-miles (Col. 8) only 5 per cent greater than 1929. What was the effect of this on reserve capacity?

Table II is a rearrangement of performance statistics taken from Table I which, with certain calculations, represents a method of arriving at an approximation of relative motive power capacity reserve that is interesting even though it may not be conclusive.

One year ago, in a similar study it was estimated that the four high weeks of 1941 would produce about 3,700,000 car loads. Translated into freight train-miles and gross ton-miles this would become an estimated 47 million train-miles and 99.6 billion gross ton-miles. The reserve capacity was estimated in the same manner as the calculations in Table II, at 3.7 per cent on the basis that 75 per cent of the freight locomotives would be in active use. What actually happened in 1941 was that, with freight train-miles at 53.8 million and gross ton-miles at 116.3 billion, the motive power reserve was not only wiped out but if only 75 per cent of the locomotives had been used the requirements would not have been met by 5.3 per cent (Col. 1). Call this a shortage, if you care to, but the fact that there *was no shortage* is due to the fact that for the first time 79.5 per cent of all freight locomotives were used.

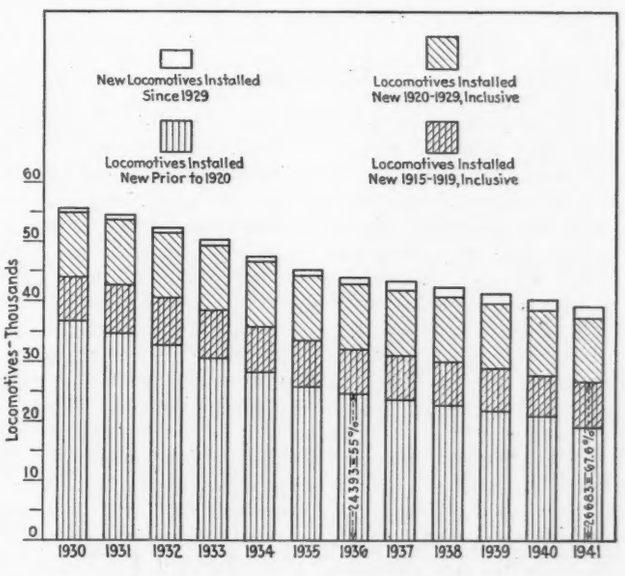
It is of interest at this point in the discussion to call attention to the fact that the reserve in 1938, 1939, and 1940, using 75 per cent of the locomotives, was 18.0, 10.1, and 9.2 per cent as compared with 1929 as a base. If, however, 79.5 per cent of the motive power had been used in 1940 as it was in 1941, with no increase in average mileage, the reserve in October, 1940 would have been 15.6 per cent (Col. 6, Table II). On the same basis Col. 2 shows why, in 1941, we "broke even."

Cols. 3 and 4 of Table II are explorations into the future. The average carloading estimates for 1942 are about 10 per cent over 1941. Accepting this and applying the performance of 1941 to the estimates of 1942, we find that if no new locomotives are added (Col. 3) our present motive-power inventory may fail by 8.3 per cent to meet the requirements of the estimated increased traffic

Table I—A Study of Freight Locomotive Utilization During the October Traffic Peaks

	Total freight locos.	Unserviceable	Stored serviceable	Active	Active locos., per cent total locos.	Aggregate tractive force, end of year (000)	Loco. miles (000)	G.t.m. (excl. loco. and tender) (000,000)	Freight-train miles (000)	Loco. miles per active loco.	Loco. miles per total locos.	Loco. miles per freight-train mile	Loco. G.t.m. per 1,000 lb. tractive force (000)	G.t.m. per train mile
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1923	33,203	5,947	1,865	25,391	76.5	1,793,785	65,973	92,640	58,492	2,600	1,990	1.13	51.6	1,584
1924	33,359	6,079	3,219	24,061	72.5	1,832,216	62,910	94,730	55,952	2,610	1,880	1.12	51.6	1,693
1925	32,390	5,423	3,055	23,812	73.5	1,827,207	65,568	100,026	58,512	2,760	2,020	1.12	54.7	1,709
1926	31,543	4,782	2,699	24,062	76.5	1,842,369	66,031	107,238	58,798	2,740	2,100	1.12	58.3	1,824
1927	30,960	4,626	3,418	22,916	74.0	1,815,903	64,231	105,797	56,582	2,800	2,070	1.13	58.5	1,870
1928	30,062	4,764	2,971	22,327	74.2	1,796,379	65,165	110,276	57,211	2,920	2,160	1.14	61.2	1,928
1929	28,912	4,477	2,680	21,755	75.5	1,768,968	64,756	110,444	56,748	2,970	2,240	1.14	62.2	1,946
1930	28,738	5,123	4,940	18,675	65.3	1,775,435	54,665	94,931	46,313	2,920	1,910	1.18	53.3	1,965
1931	28,667	6,071	6,225	16,371	57.3	1,755,779	44,903	75,403	40,250	2,740	1,560	1.11	42.8	1,873
1932	27,310	7,891	5,801	13,618	50.0	1,719,166	40,372	66,143	36,344	2,970	1,480	1.11	38.4	1,820
1933	26,925	8,985	3,787	14,153	52.8	1,672,763	40,589	65,812	36,476	2,860	1,510	1.11	39.4	1,804
1934	25,964	8,707	3,402	13,855	53.7	1,597,000	41,205	66,311	37,159	2,960	1,585	1.11	41.3	1,785
1935	25,144	8,414	2,213	14,517	57.9	1,567,482	45,151	75,671	36,858	3,120	1,800	1.22	48.2	1,895
1936	24,498	6,813	1,642	16,043	62.9	1,563,874	50,742	86,987	44,333	3,170	2,070	1.14	55.8	1,948
1937*	23,889	5,914	1,673	16,302	68.4	1,556,345	50,117	88,245	44,572	3,070	2,100	1.12	56.5	1,998
1938*	23,729	7,300	1,785	14,665	61.9	1,522,530	44,622	79,951	39,615	3,040	1,880	1.12	52.5	2,036
1939*	22,909	6,425	832	15,652	68.4	1,487,240	49,945	93,209	44,034	3,190	2,180	1.13	62.7	2,137
1940*	22,186	5,253	1,352	15,581	70.4	1,469,696	49,983	92,946	44,272	3,200	2,249	1.12	63.2	2,120
1941*	21,830	3,528	841	17,461	79.5	1,463,223	61,501	116,340	53,866	3,522	2,812	1.14	79.5	2,183

* Data from I. C. C. Bureau of Statistics, Freight Service Operating Statistics of Class I Steam Railways in the United States (Statement No. M-210, to and including 1935); Freight Train Performance of Class I Steam Railways in the United States (Statement No. M-211 OS-A, 1936 to date); and Motive Power and Car Equipment of Class I Steam Railways in the United States (Statement No. M-240 OS-F). Aggregate tractive force based on A. A. R. Car Service Division Form CS-56A-1 for the end of the year, except 1941, which is as of June 30.



Trends in the Age of Steam Locomotives

in October, 1942. Col. 4 is an estimate based on the addition of 1,000 new locomotives by that date, with a corresponding increase of 1,000 active locomotives.

If there is any logic in this method of reasoning, there are several vital facts that stand out with respect to the future ability of the railroads to handle the freight traffic they will undoubtedly be called upon to take care of. In order to do the job that was done in October, 1941, it was necessary to "call out the reserves." By comparison with 1929 the conditions of 1941 can best be visualized by the fact that out of each 100 locomotives 79.9 were on the road each running a total of 3,522 miles in one month; 16.2 were in or awaiting shop, and 3.9 were stored serviceable. In 1929 75.5 were on the road each running 2,970 miles; 15.4 at the shop and 9.2 stored serviceable. This raises the question of "stored serviceable" power. How much more useful were the 9.2 locomotives stored in October, 1929, than the 3.9 locomotives stored in 1941? Possibly some enginehouse foreman could throw light on this subject. A study of the accompanying age distribution chart will also show how much older the average locomotive is today than it was in 1929; no doubt some of the locomotives now in storage were also in storage in 1929.

William C. Dickerman, chairman of the board, American Locomotive Company, speaking before the American Society of Mechanical Engineers last month, estimated that the builders would be called upon to deliver 1,000 new locomotives by next Fall, including those now on order. He also considered this number to represent approximately the shop capacity now available for locomotive construction. Our own study suggests the necessity for the use of this capacity to the full.

Table II—Potential Capacity of Freight Motive Power During October Peak Traffic

	1941 1	1941 2	1941 3	1941 4	1940 5	1940 6	1939 7	1938 8	1929 9
Total no. of freight locomotives	21,830	21,830	21,830	22,830	22,118	22,118	22,909	23,729	28,912
Percentage of freight locos. active	75	79.5	79.5	80.3	75	79.5	75	75	75
No. of freight locos. active	16,373	17,355	17,355	18,355	16,588	17,583	17,182	17,797	21,755
Av. no. miles per locomotive	3,522	3,522	3,522	3,522	3,200	3,200	3,190	3,040	2,970
Potential freight loco.-miles at above average (000)	57,666	61,124	61,124	64,646	53,082	56,265	54,811	54,103	64,612
Loco.-mi. per freight train-mi.	1.14	1.14	1.14	1.14	1.10	1.12	1.13	1.12	1.14
Potential freight train-mi. at above average (000)	50,584	53,618	53,610	56,707	48,256	50,237	48,505	48,306	56,600
G.T.M. per train-mile	2,183	2,183	2,183	2,183	2,120	2,120	2,137	2,036	1,946
Potential gross ton-miles (000,000)	110,425	117,314	117,031	123,791	102,303	106,502	103,655	98,351	110,143
Actual gross ton-miles during October (000,000)	116,340	116,340	126,800	126,800	92,946	92,946	93,209	79,951	110,444
Relation of potential to actual, per cent	−5.3	+0.9	−8.3	−2.3	+9.2	+15.6	+10.1	+18.0	....

Conclusion

For several years the wisdom of replacing much of the older motive power with modern high-capacity units has been advocated. There are several roads in this country that today stand out as striking examples of the value of that policy. There are, on the other hand, motive power and operating men who still believe that their roads can get by with a locomotive inventory which grows older in average age with each passing year; which, because of obsolescence, may fail to an increasing degree to measure up to the job that lies before us and which, if for no better reason, should be brought up to date to keep down the cost of maintenance.

These are the roads that need a large proportion of all the new locomotives which can be built by October 1, 1942. It has been an interesting experiment to see how far reserve capacity can be stretched, but if 1941 is any indication, the limit has almost been reached in the matter of active locomotives. How much farther it may be safe to expect increases in locomotive mileage is a matter for individual roads to decide. In view of the increasing proportion of locomotive building capacity being absorbed by direct defense production and the shortages of material that are certain to be encountered during the next two years, the decision to make known their requirements and to get them fitted into our production program should not be delayed. The ability to furnish rail transport in any volume that may be asked for is a duty to our defense program of first importance.

How Many Freight Cars for 1942?

(*Continued from page 45*)

thermore, such a margin under conditions likely to obtain throughout the coming year, when the peak four weeks (7.7 per cent of the year) will encompass little more than 8.5 per cent of the year's business (they have frequently accounted for between 9 and 10 per cent of the year's business), will increase the number and frequency of tight situations in which the Car Service Division of the A. A. R. must intervene. This intervention, while effective in meeting the demand for cars, is wasteful in other respects since, by increasing empty car miles, it requires otherwise unnecessary freight-train miles and to some extent increases the demands for motive power.

It would, therefore, seem to be the part of wisdom for the railroads, the car builders, and S. P. A. B. to set as the goal for October 1, 1942, the larger increase of about 140,000 freight cars, knowing that, if circumstances prevent its complete fulfillment, there is still some margin of safety.

In order that a net increase of 140,000 freight cars on line may be effected the number of new cars required will have to be increased by the number of cars retired. If the 1941 rate of retirements prevails, this would require approximately 30,000 additional cars. No doubt this number of retirements will be reduced during 1942 and, indeed, might, in the emergency, be practically eliminated entirely, without serious detriment to the service.

One of the factors likely to limit the number of cars which can be built by October 1, 1942, is the builders' plant capacity which remains available for car construction. No plant capacity will remain idle long under present conditions. The ability of the railroads to continue to secure equipment will, therefore, depend upon prompt placing of orders so that production schedules may be laid out to utilize to the full all of the plant days available. Otherwise, they will soon cease to be available for the building of railway equipment.

To risk a transportation inadequacy during 1942 is to risk an irretrievable loss of the productive output of the man power and the plant capacity of the nation.

Excess Machine Capacity Offers An Opportunity For Service

Idle hours of machine tools in railroad shops can be used in defense work to the advantage of the nation and the railroads

By H. C. Wilcox
Associate Editor

THERE is one place in the railroad industry where excess capacity exists—in the machine shop departments of our medium and large locomotive repair shops. It so happens that under present conditions, the use of this excess capacity for defense production may be of vital importance. The statement that excess capacity does exist may seem to be a contradiction which requires some explanation. The excess capacity of a railroad shop or an industrial shop, for that matter, as far as machine tools are concerned, is indicated by a machine load factor which shows the relation of the actual use of the machines in hours to the total number of hours that they might be used. In a shop of the size of many of our railroad repair plants there would probably be found, for sake of discussion, about 300 machine tool units. The potential capacity of such a shop may vary from 624,000 machine hours on a single-shift 40-hour week basis to 874,000 machine hours on a single-shift 56-hour week basis with necessary allowances made for machine servicing time.

Tools Worked One-Fourth of Time

Some recent studies have disclosed that during depression years the machine load factor on a single-shift 40-hour week basis was as low as 35 per cent leaving an excess capacity of 65 per cent. If the same performance were measured against a seven-day week, the load factor drops to 25 per cent and the excess increases to 75 per cent. By comparison with a seven-day, 24-hour operation the potential capacity of the above shop becomes over 2½ million machine hours per year and the excess capacity may be as much as 70 per cent under present conditions, assuming that most of the machines in the shop are used only eight hours per working day.

The only reason for going into this detail is to define one kind of excess capacity—that which exists simply because machine tools are not used 24 hours a day for seven days a week. Another type of excess capacity exists because machine tools are not utilized in such a manner as to secure maximum production from them. Of the two kinds of excess capacity our railroad shops have more of the former than of the latter.

Right now there is real need to use all of our idle machine tool capacity on defense work. This is especially true of the available machines of large size and heavy-duty design. The proposal to use railroad shop machines of this type makes it worthwhile to point out two things: First, if these machines are going to be used additional hours, the problem of skilled operators must first be solved. These heavier machines are, as a rule, now manned by some of the best operators in any shop and either these men must work longer hours or skilled men on less important machines must be transferred to the extra shifts and new men be trained to take the places of the transferred men. Second, the age and condition of many of these much needed machines may prove of great importance. A study of a typical 300-machine railroad shop will show that about 20 per cent of the machines are less than 15 years old; another 20 per cent from 20 to 25 years old; about 55 per cent from 25 to 35 years old and the remainder over 35 years old. This gives an experienced production shop man a fairly accurate picture of the character of the excess capacity of the average railroad shop.

Many times during the last 10 years, the desirability of replacing obsolete railroad-shop machine-tool units has been emphasized but in spite of this the average age of all machines in our shops has been steadily increasing. Replacement has been advocated on the grounds of increased production and decreased maintenance costs, but there are a number of railroad mechanical men who have argued against the installation of new machines, particularly of the large units, on the ground that they are not used nearly as many hours in the course of a year as some of the smaller high-production machines and, therefore, have a longer service life.

Up to a month ago a major factor in the replacement of equipment in any plant was its ability to reduce costs for its owner. Under war-time requirements costs may be an important factor but production at any cost is more important. The excess machine-tool capacity of railroad shops, such as it may be, offers an opportunity to utilize these older machine tools to the limit of their usefulness and in so doing to get out of them the unused hours of service that have been accumulating over the years of their life.

Each road and each shop can estimate very quickly how much extra usage can be obtained from these machines.

Co-operation of Benefit to All

It is important to know now where and to what extent excess machine-tool capacity exists. Cooperation by the railroads with the government at this point may form the basis for a give-and-take relationship which will be equally serviceable to the prosecution of our all-out war program and to the railroads themselves. Furthermore, it may, so to speak, clean up the unused capacity of much machine-tool equipment which is now, or is rapidly growing, obsolete even though it is young in the potential hours of service originally built into it. The time will come, perhaps before but certainly after the end of the war, when these obsolete and worn-out tools can be replaced with wholly modern equipment.

Progress in the Electrical Field

Railroad plant capacity can be materially increased by the work of the electrical department

By Alfred G. Oehler
Electrical Editor

INTENSIVE demands now require that much electrical equipment in service must do double or triple duty; it must be supplemented by new equipment to satisfy still more urgent needs.

Lighting

The term "blackout lighting" infers no light at all. Actually it means facilities for dimming lights, and confusing map patterns with immediate recourse to regular lighting as soon as the all-clear is sounded.

The second special requirement is protective lighting. Special units are being produced for lighting areas subject to sabotage These units distribute light to help guards to detect trespassers, and the light distribution is sharply controlled to avoid directing glare where it might interfere with operation on the railroads and highways.

An innovation in yard lighting has been introduced by the Rock Island. This involves the use of very long cross-arms, permitting the setting of poles in advantageous locations, while the lights are over driveways. Lowering hangers make it comparatively easy to clean units and replace lamps.

Much that is new in lighting is centered around the present rapid development of fluorescent lights. The use of incandescent lights is also being stimulated by the need of protective lighting. Fluorescent lights are now providing illumination values in passenger cars as high as 30 footcandles. Some fluorescent-lighted industrial shops have 70 footcandles on the working plane. The use of fluorescent lights on passenger cars has been facilitated by the introduction of a direct-current booster —an efficient means for producing the necessary 60-volts on cars equipped with 30-volt systems. Plastics are now satisfying many of the needs for efficient and attractive car fixtures. Their use largely eliminates bezels, screws and other metal parts and simplifies the removal of shades for cleaning and lamp replacement.

The introduction of small size fluorescent lamps has permitted the application of numerous convenience-type lighting fixtures for berths, washrooms, etc.

Night lights such as now used in passenger cars may prove valuable for blackout lighting. Another means for producing light to facilitate walking through cars at night is the use of fluorescent dyes on carpets, illuminated by low values of ultra-violet light.

Data compiled by two roads on the effectiveness of lighting highway crossings with sodium lights show that

after the installation is made the crossing becomes a safer place at night than it is in the daytime.

Motors

Many new and improved types of motors for a variety of purposes have been made available during the past year. Important among these are the new lines of squirrel-cage induction motors. A new line of variable voltage reversing planer motors and motor-generator sets was produced in sizes from 30 to 100 hp., operating over a speed range from 40 to 1200 r. p. m. New fractional horsepower motors have been made available for machine tool service. These products are of interest to the railroads because machine tools are now being required to produce greater output; this may be accomplished by increasing hours of service or machine capacity.

A combination electric and inductor dynamometer, built for engine testing, has the electric end arranged for forced ventilation and the inductor end water-cooled. It has a capacity of 2800 hp. and a speed range of 800/2000 r. p. m.

An innovation in motor control is an electronic motor control system for operating direct-current motors from alternating-current lines. Complete control of the motor is accomplished without rotating parts.

Electric Welding and Heating

An outstanding development in the field of welding is the automatic spot welder now being used for assembling sides and roofs of freight cars. Stored energy welding, as applied to spot welding, is serving to control accurately the heat at the weld without overtaxing the capacity of supply lines. Special welding units for thin-gage metals allow arc welding to be used satisfactorily on tubing with a wall as thin as 35 mils. A unique application of induction heating is used for applying and removing the inner bearing sleeves of motor bearings on rail-motor cars. The same principle, employing higher frequencies, is now being used widely in industry for hard-surfacing. Loading resistors, consisting of finned electric resistance units, have been employed for load testing of Diesel generator sets.

Power Supply

Provisions for exceptional power demands have been made by the construction of two 10,000-kw. mobile steam-electric power plants, mounted on special railway cars. This equipment was made for Navy Department work. A large mobile unit substation on a railway flat car was also built to take power from transmission lines ranging from 11,000 to 144,000 volts.

New steels and new forms of construction are reducing size and increasing efficiency of distribution transformers. New capacitor units have been made available for improving the power factor of distribution lines. These may prove particularly beneficial at a time when copper is at a premium.

Electric Traction

More intensive use is being made of electric locomotives; improvements in design and increasing demands of traffic may advance the time when additional electrification will be in order. New electric locomotives under construction will serve to relieve the present increasing traffic demands on electrified lines.

Reports made by a number of railroads show an increased use of graphite for lubrication of pantographs and contact wires. Pantograph shoe life has been greatly increased (in some cases 3½ times) by its use.

The greatest activity in Diesel-electric locomotives is in the field of the switcher. A large number of these units are being placed in service by railroads, industrial plants and government arsenals, proving grounds and construction camps. Four-cycle 1000-hp. Diesel engines have been applied to road service. Double reduction gears used in connection with 400-hp. Diesel engines were applied to 70-ton switchers to produce a medium cost locomotive having exceptional performance for specific applications.

A number of rail cars have been placed in service which are equipped with Diesel or semi-Diesel horizontally-mounted engines supplying traction and all other power requirements. In some cases the transmission is electric and in others it is a combination of fluid and mechanical drive. Even where mechanical drive is used the car is equipped with three power-generating systems, involving four generators, three batteries and the necessary control equipment. There are also electric heaters, electric lights and an electrically-operated air-conditioning system. There are electrically-operated fuel pumps, defrosters, water protection heaters, exhaust fans, supply water heaters, etc. In one application an amplidyne control was used to insure maximum engine output at all vehicle speeds.

Air Conditioning

Developments in the field of car air conditioning include the use of divided evaporators, a portion being used at light loads to produce effective humidity control. These are employed with compressors which operate at variable speeds or which may be unloaded in steps to avoid cycling. A development in the field of propane-powered air-conditioning systems, applicable to cars in which undercar clearances are limited, consists of an engine driving a rotary compressor and a generator which supplies power to the fans of a separate condenser. Electrostatic filters for cleaning air are being tried and appear to be highly effective.

Contributions to refrigeration of freight cars have been supplied in two forms. One of these consists of axle-driven fans (motor-driven at terminals), to circulate air and avoid unequal cooling. Rapid progress is being made in the application of propane-powered refrigeration systems for freight cars. These are in experimental use and are proving highly effective.

A new type of wheel-slide control has been developed to increase the effectiveness of braking and avoid slid-flat wheels.

One railroad has worked out effective means for electrically controlling the operation of gasoline-driven pumps at remote locations.

An automatic "electric filling station" now permits operators of industrial trucks, owned by a number of stevedoring companies, to charge batteries from a railroad charging plant without the need of special supervision or individual circuit metering.

Testing equipment employing magnetic strain gages and oscillograph recorders has been made available by the Association of American Railroads. It is portable and can be moved from one location to another. At the present time it is in service for the purpose of determining the effects of different amounts of counterbalancing, and it has many other potential applications.

The use of communication systems has been extended for yard operations, and is proving highly effective.

A Review of Railway Operations in 1941

The largest freight traffic in history was moved without shortage or congestion; railways have big task before them

By Dr. Julius H. Parmelee

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WAR, and its spread into broader and broader areas throughout the world, overshadowed and indeed controlled all the principal events of 1941. This proved true in the United States, as in all other important nations, whether belligerent or not. In this country, a series of historic steps brought us closer to the brink of open hostilities and finally, in December, plunged us into the vortex. To meet this eventuality, the American people through their government continued in 1941 to move into a more adequate and extensive defense position. The President in January set up the Office of Production Management, which took over much of the work of the Advisory Defense Council, although Ralph Budd retained his post of Transportation Commissioner with that Council. Later defense organizations were SPAB (Supply Priorities and Allocations Board), OPACS (Office of Price Administration and Civilian Supply), now broken down into two separate groups, OPA and CS, and the Economic Defense Board.

The President approved the first lend-lease act on March 11, thus making the United States in fact the "arsenal of democracy." Other steps were amendments of the Selective Service Act and of the Neutrality Act. During the year, too, the United States began its patrol of the western section of the North Atlantic against submarines, established military and naval outposts on a number of the bases obtained from Great Britain in 1940, and occupied strategic posts in Iceland and Dutch Guiana.

Came finally the treacherous attack of Japan, on December 7, followed by war declarations by Hitler and his Italian and lesser satellites. We accepted these challenges, and by the close of a momentous year were in the midst of what is in truth a World War.

What did these events mean, in respect of domestic activity? They meant, first, a series of large appropriations by Congress, for military, naval, shipping, and air expansion, and for the defense, lend-lease, and war programs. By the end of 1941, more than seventy billions had been authorized or appropriated for these purposes. They meant, second, a gradual increase in actual defense production, including the construction of new plants, enlargement of existing plants, and employment of millions of workers. Despite a corollary slowing down in some lines of commercial and civilian production, as of automobiles, the net effect was increased production, increased employment, and increased demand for goods and services of all kinds. This meant, finally, a growing demand for transportation service, especially by rail, by highway, and by air.

Railroads of the United States felt, of course, the quickening effect of these developments. Their freight traffic, measured in carloadings, had increased 11.3 per cent from 1938 to 1939, and again by 7.2 per cent from 1939 to 1940. A further and greater increase of 16.2 per cent occurred between 1940 and 1941. Ton-miles showed even greater rates of increase, and in 1941 surpassed all existing records, even that of 1929, which had stood for twelve years.

Passenger traffic also felt the stimulus, although to a lesser degree than freight traffic. Passenger-miles increased 4.7 per cent from 1938 to 1939, 4.9 per cent from 1939 to 1940, and 22.1 per cent from 1940 to 1941.

In both freight and passenger fields, the defense, lend-lease, and war programs accounted for a substantial part of the increased traffic by rail in 1941. It follows that so long as those programs continue, and rise to higher levels than in 1941, railroads will experience heavy demands on their facilities; by the same token, as soon as the war closes, whether in the near or the more distant future, rail traffic and revenues will be adversely affected.

Our railways have entered this war in much better condition to meet their manifold obligations than they did in 1917. They are better organized, both as individual units of the industry and as regards their collective efforts as an industry. The railroad plant and equipment is in good physical condition, with operations at the peak of efficiency. Shippers have also organized since the last war, and their cooperation with the carriers in meeting the problem of transport has been and will continue to be invaluable. Better co-ordination with the government exists, which is exercised through the Transportation Commissioner and his committees, and through the several military and naval agencies. Transport, that vital link in the chain of service of supply, is girded for its tremendous task as never before.

The railroad story of 1941 consists largely of accomplishment and preparation; accomplishment, in moving the largest freight traffic in history without shortage or congestion; preparation, for the even more pressing demands of the future.

Traffic Forecasts vs. Traffic Realities

Generally speaking, forecasts of railway traffic in 1941 were optimistic, running up to a maximum of 46,200,000 carloads as a total for the year, and up to 1,030,000 cars in the peak week of October. On the basis of these forecasts, a car shortage of 130,000 cars at the peak was predicted. These predictions were accompanied by criticism of rail carriers for failing to prepare themselves with an adequate supply of freight car equipment for the expected peak.

Studies by the railroads themselves, and the Associa-

tion of American Railroads, led to more conservative forecasts. Their conservatism rested on a number of bases, including the very important and significant factors of close contact with shippers and the railroads' own knowledge of the situation.

Actual traffic results ran ahead of some of the earlier forecasts made in January and February, because in those months the lend-lease act had not been passed, and the defense program itself had not been stepped up to the extent later experienced. On the other hand, actual traffic results fell far below the more optimistic forecasts, both as to aggregate loadings in 1941 and as to the peak, and no vestige of the predicted car shortage materialized.

Total loadings for the year reached 42,250,000 cars. The peak loading was 922,884 cars in the week ended October 18, which compares with corresponding peaks of 856,289 cars in 1939, and 837,657 cars in 1940.

When it became evident that some of the more optimistic forecasts of traffic would not be realized, certain forecasters shifted their emphasis from criticism of the railways for not providing themselves with sufficient equipment, to criticism of their methods of handling and utilizing equipment. They concluded that the railroads should get along with no net addition whatever to their freight car equipment, but with only enough deliveries of new cars to replace retirements. At the same time, suggestions were offered as to ways by which to speed up movement of freight cars, reduce free time for loading and unloading, and shorten delays in terminal and intermediate yards. Forecasters also turned their attention to traffic estimates for 1942 and succeeding years. The most frequent estimate was that railway freight traffic in 1942 would increase approximately 10 per cent over 1941.

These forecasts for 1942 have a rather close relationship to the equipment program of the carriers themselves for that year, to which attention is next directed.

Equipment Program for 1942

As the defense and war programs expanded during the year 1941, it became clear that even so vital an industry as the railways might have difficulty in obtaining sufficient allocations of steel and other materials for the construction of new equipment, such as they had programmed. It was recognized that equipment could be added to the available supply, both by adding new units to the equipment supply and by reducing the number of unserviceable units. Repairs to locomotives and cars call for smaller amounts of material than construction of new ones, and the resulting gain is much the same, so far as the number of serviceable units is concerned. The railroads therefore extended their preparedness program along two general lines; the first of which consisted of a further broadening of their program of equipment repairs, as a result of which the number and proportion of units in bad order were materially reduced.

This is indicated by the following summary table, which shows the percentage of unserviceable steam locomotives and unserviceable freight cars, as of the beginning of each of the years 1939 to 1941, and as of December 1, 1941.

Unserviceable Ratio

	Locomotives (Steam)	Freight Cars
Jan. 1, 1939	18.6%	14.0%
Jan. 1, 1940	15.9	9.6
Jan. 1, 1941	14.9	6.8
Dec. 1, 1941	9.2	4.1

The other phase of the railway preparedness program involved the construction and installation of as many new units of motive power and freight cars as practicable, in the light of expanding war needs for materials.

To this end the railways surveyed and revised their equipment program in December. Using the twelve months from October 1, 1941, to October 1, 1942, as their program period, they arrived at the following result. The number of freight cars on order on October 1, 1941, was 88,819. The December survey indicated additional orders of 26,651 cars, making a total program of 115,470 freight cars.

Similarly, in the steam locomotive field, the number on order on October 1, 1941, was 309. Additional orders of 70 units brought the total program for the succeeding twelve months to 379 units. As to Diesel and electric locomotives, the number on order on October 1 was 362, to which was added 233 further orders, making a total program of 595 for the twelve months.

Deducting the installations made in October and November, the balance of the program for accomplishment during the ten months from December 1, 1941, to October 1, 1942, is outlined below.

Locomotives:	Total program	Installed Oct.-Nov.	Installation program to Oct. 1, 1942
Steam	379	39	340
Electric and Diesel	595	93	502
Freight cars	115,470	16,731	98,739

These figures make it clear that deliveries must be at a somewhat higher rate per month, during the ten months to October 1, 1942, than in the later months of 1941, if the realistic program laid down by the railways is to be fulfilled. Strong representations have been made to government authorities to that effect, in the hope of obtaining larger monthly allocations of the necessary materials.

If the program thus outlined is carried out, the carriers believe they can move an increase of 10 per cent in freight traffic in 1942, compared with 1941, without serious difficulty and without motive power or car shortage. An increase of more than 10 per cent would probably require a somewhat more intensive use of the equipment than at the peak periods of either 1940 or 1941.

Such a program, accompanied by still further reductions in bad order percentages, would mean that the serviceable railroad ownership of equipment on October 1, 1942, compared with October 1, 1941, should show approximately the following increases: more than 1,400 steam locomotives, more than 200 electric and Diesel engines, and nearly 100,000 freight cars.

The Wage Movement

Perhaps the most pressing internal problem faced by rail carriers in 1941 lay in their discussion of wage rates with their employees. This problem absorbed many months of time and effort, and while a settlement eventually emerged, the settlement was costly, and left some unfortunate implications behind it.

Demands on the railroads for increased wage rates were filed on June 10, 1941. Two groups of demands were included: first, by the five train and engine service or "operating" brotherhoods (enginemen, firemen, conductors, trainmen, and switchmen), and second, by 14 so-called "cooperating" unions of non-transportation or "nonoperating" employees (machinists, boilermakers, blacksmiths, sheet metal workers. electrical workers, carmen, firemen and oilers, telegraphers, clerks, maintenance of way men, signalmen, and three marine groups).

These demands ran through the usual procedure of conference and mediation, strike balloting, and the threat of nation-wide strikes, leading to the appointment of a

five-man fact-finding or emergency board by the President on September 10, under the provisions of the Railway Labor Act.

When the Emergency Board met in Chicago on September 15, it found itself confronted with the most complex set of problems ever facing such a body in the past, and for the following reasons.

1. Two different sets of wage demands were involved. The operating group, some 250,000 in number, demanded an increase of 30 per cent in basic wage rates, retroactive to July 10, with a minimum increase of $1.80 per day. The nonoperating group, some 800,000 in number, demanded an increase in basic wage of 30 cents per hour, and a minimum hourly wage of 70 cents, all retroactive to July 10. The average increase demanded for this group was between 45 and 50 per cent.

2. In addition, the nonoperating group demanded annual two-week vacations with pay. This demand was originally made in 1940, had been mediated without success early in 1941, and was carried over into the demands of June 10.

3. On the other side, the submission to the Emergency Board included a proposal of Western rail carriers, notice of which had been served by them on May 25, 1940, for a decrease of 10 per cent in wage rates of the nonoperating group, to offset the vacation demands of that group.

4. In addition, Western and Southeastern carriers had served on the nonoperating group a proposal to modify ten of the working rules of that group, in an endeavor to clarify the working agreements, and to eliminate certain costly practices. A previous proposal by the carriers for modifications of certain operating rules was by mutual agreement postponed for later negotiation, and did not come before the Board.

5. Finally, employees of the Railway Express Agency, Inc., had made the same wage demand as the nonoperating railway group, and that became a part of the submission to the Board.

Faced with these complex and widely differing problems, the Emergency Board obtained two extensions of time. It held exhaustive hearings, followed by argument, from September 15 to October 22, and filed its report to the President on November 5, instead of on October 10, when the statutory thirty-day limit on its deliberations would have expired.

In the course of the hearings, the railways offered a plan of settlement, involving an adjustment of wage rates from November 1, 1941, and successive adjustments each three months until the end of 1942, all based on an index number calculated according to a combination of (a) changes in the cost of living and (b) changes in the total operating revenues of the carriers. This offer was not accepted by the employees, nor did the Board adopt it.

The principal features of the Board's report of November 5 were as follows:

1. The Board recommended an increase of 7½ per cent for the operating group, to be retroactive to September 1, 1941, and to run 16 months to December 31, 1942.

2. The Board recommended an increase of 9 cents per hour for the nonoperating group, a minimum of 45 cents per hour, and a one-week annual vacation with pay; the wage and minimum provisions to be retroactive to September 1, 1941, and the vacation provision to become effective on January 1, 1942. The wage provision would run 16 months to December 31, 1942; the minimum-wage and vacation provisions would be without termination date.

3. The Board's only recommendation as to short lines was that the minimum wage on those lines be increased from the existing statutory level of 33 cents to 40 cents per hour.

4. As to express employees, the Board recommended an increase of 7½ cents per hour.

5. The rules question was remanded back to the respective parties for further conference and negotiation. The 10 per cent reduction proposal disappeared from the picture.

Although the recommendations of the Emergency Board represented an increase of some $265,000,000 in the annual railway payroll, including payroll taxes, the carriers accepted the terms of the report, and notified the President of their willingness to put the provisions into effect.

Both groups of employees, however, refused to accept the recommendations, and the operating group on November 13 issued a strike call, effective on December 7, 8 and 9.

Following a number of conferences at the White House, at which the parties and officials of the government were present, and following further unsuccessful conferences between the parties, the President reconvened the Emergency Board for a further hearing, which took place at Washington on November 28 and 29. At the close of the hearing, the Board with the consent of the parties resolved itself into a mediation board, and after two days of intensive effort evolved an agreement to which all parties assented. According to this agreement,

1. The wage increases to both groups became part of the basic wage, without termination date.

2. The wage increases recommended by the Emergency Board were agreed to, but only for the period of three months from September to November 30, 1941.

3. Effective December 1, 1941, the wage increase to operating group became 9½ cents per hour, equivalent to 76 cents per basic day's pay in the train and engine service. This raised the rate of increase from 7½ per cent, as originally recommended by the Board, to an average of 10.6 per cent.

4. Effective December 1, 1941, the wage increase to the nonoperating group became 10 cents per hour, instead of 9 cents. The vacation provision (effective January 1, 1942) was liberalized as to clerks and telegraphers to six, nine, and twelve-day annual vacation with pay, dependent on length of service. The mediated wage provision raised the rate of increase from 14.0 per cent, as originally recommended by the Board, to 15.6 per cent.

It is estimated that the mediated wage and vacation provisions, together with payroll taxes and an allowance for collateral wage increases to certain employee classes not involved in the wage controversy, will amount to approximately $331,771,000 per year, calculated on the basis of 1941 employment levels. The original demands of the two groups of employees, applied to the employment levels of 1941, would have cost the carriers approximately $900,000,000 per year.

This extended and widely publicized wage controversy emphasized the strength of labor in the present economic and political organization of the country. Despite the critical international situation, certain railway labor groups showed themselves ready to create a serious transportation tie-up, rather than to accept the judgment of an impartial and able body of men, selected for their difficult task by the President. It seems unquestionable that the Railway Labor Act, which has been held up as a model of its kind, in principle and in practice, was thus weakened at the hands of those who should be most interested in maintaining it in full strength and vigor. Unfortunately, the Emergency Board did not receive that government support to which it was entitled, and threat of force replaced the more orderly procedures prescribed by law.

Material and Supply Costs

Preliminary figures indicate that the average price of fuel, material and supplies purchased by railways, weighted according to their utilization of the several groups of items, increased about 9 per cent during the year 1941.

Rates and Fares

With their annual wage and payroll tax bill increased by $332,000,000 per year, and with some $89,000,000 of

back pay and payroll taxes already absorbed by the railways during the four months from September to December, 1941, carriers felt it imperative to obtain offsetting rate and fare increases, as early in 1942 as practicable.

They filed a petition with the Interstate Commerce Commission on December 13, requesting authority to increase their freight rates and passenger fares by 10 per cent, with certain exceptions. They asked that hearings of their petition be expedited, that the rate adjustments be made by means of supplements to existing schedules, and that the increases be permitted to become effective on one day's notice.

The Commission acted promptly on the petition, docketed the case as Ex Parte 148, and arranged for hearings to begin on January 5, 1942, at Chicago. The Commission further announced its intention of expediting the proceedings in every way.

Legislation and Legal Action

The first session of the 77th Congress, which opened on January 3, 1941, and continued throughout the year, enacted or considered a comparatively small number of legislative proposals closely affecting rail carrier interests.

Pipe Line Bill (Public Law 197—77th Congress). This measure had its genesis in an investigation of the petroleum industry by a subcommittee of the House Committee on Interstate and Foreign Commerce. The President in January requested the subcommittee to consider whether national defense needs called for a policy of assistance and encouragement to pipe line construction. Hearings were held, and its chairman, Representative Cole of Maryland, on May 29 introduced H. R. 4816, generally known as the "Pipe Line" bill. The measure passed both houses with minor amendments, and was signed by the President on July 30. It grants the power of eminent domain to pipe line companies under certain circumstances and authorizes the Federal Government to construct pipe lines necessary for national defense, provided such lines cannot be privately constructed.

Revenue Act of 1941 (Public Law 250—77th Congress). A new tax bill (H. R. 5417) designed to raise 3½ billions was reported favorably to the House of Representatives by the Ways and Means Committee on July 24. With some modifications, the bill was approved on September 20. Corporation taxes were increased by imposition of new surtaxes.

In addition to affecting railroad companies as tax-paying corporations, the act contains a provision (Sec. 554) imposing a tax of 5 per cent to be collected by the carriers on and after October 10, 1941, upon the amount paid by persons for passenger transportation by rail, motor vehicle, water or air.

Senate Resolution 128. The Senate on July 22 directed the Railroad Retirement Board to investigate and report on "the incidence of injuries and diseases incurred by employees through employment in the railroad industry and economic consequences of such injuries and diseases." Progress was made in 1941 in assembling the required information.

Control of Freight Forwarders. Legislative steps were taken looking toward regulation of freight forwarder operations by the Interstate Commerce Commission. Senators Wheeler and Reed introduced S. 210 on January 8, which would place the relationships of forwarders with their customers and with the carriers whose services they utilize, under Commission regulation. The measure passed the Senate on March 24. Early in March, a bill (H. R. 3684), relating to the same matter but differing in many respects, was introduced in the House by Chairman Lea of the Committee on Interstate and Foreign Commerce. After extensive hearings, the House Committee in August reported a revised bill, which retained the Senate number S. 210, but which struck out the substance of the Senate measure and substituted a House measure. This bill passed the House on October 23, and was sent to conference.

Sizes and Weights of Motor Vehicles. The Interstate Commerce Commission, in Ex Parte No. MC-15, instituted a proceeding in November, 1937, for the purpose of carrying out a Congressional mandate to investigate the need for Federal regulation of sizes and weights of motor trucks. The Commission, in its report to Congress on August 14, 1941, recommended that the Commission be given certain regulatory powers for that purpose. Bills have been introduced in both houses designed to carry out this recommendation.

Rivers and Harbors Bill (H. R. 5993). The genesis of this bill will later be reviewed, in the section dealing with highway and waterway developments.

Oklahoma Train Limit Law Upheld. Constitutionality of the Oklahoma Train Limit Law, which limits the length of freight trains in that state to 70 cars, was upheld in a decision rendered January 11 by a statutory three-judge Federal court.

Conviction under Federal Train-Wrecking Law. A sentence of 14 years' imprisonment was imposed upon three men by the district court in Sacramento, California, on March 14, for tampering with the Southern Pacific main line track near Towle, California, on February 8. This was the first conviction under the Federal law making attempted train wrecking a Federal offense.

Board of Investigation and Research

The Transportation Act of 1940, approved September 18 of that year, set up a temporary three-man Board of Investigation and Research, to study three principal transportation problems, namely; (1) the relative economy and fitness of carriers by railroad, motor and water; (2) the extent to which the several classes of carriers have been subsidized; and (3) the extent to which taxes are imposed on each class of carriers.

The Act gave the Board two years, or until September 18, 1942, within which to prepare and submit its report, with a possible extension of two more years, by executive order of the President.

Not until March 20, 1941, did the President send the nominations of Board members to the Senate for confirmation. No action was taken for several months, and the President in July substituted names for two of the original three. The three men thus nominated, and confirmed, were Nelson Lee Smith of New Hampshire, C. E. Childe of Nebraska, and R. E. Webb of Kentucky.

The Board is operating with an appropriation of $346,500. It elected Mr. Smith as its chairman, and has set up a staff consisting, among others, of a Secretary, a General Counsel, a Chief Economist, and three section chiefs, dealing with economic fitness, subsidies, and taxes, respectively.

In addition, the Board appealed to all interested parties to submit to it such suggestions and recommendations as might seem pertinent, in order that it might develop a definite program of research and investigation.

Reorganizations

A net reduction of six (from 103 to 97) took place during 1941 in the total number of railway companies in receivership or trusteeship. This change of six occurred as follows: Two Class I companies, the Chicago & East-

ern Illinois and the Chicago Great Western, were discharged from trusteeship. Four Class III carriers and one small leased line were discharged from either trusteeship or receivership. This made a total of seven companies so discharged. On the other hand, one new company (a Class III carrier) entered trusteeship. Certain other changes during the year, such as the transfer of two companies (one a Class I carrier, the Florida East Coast) from receivership to trusteeship, and the entry into and discharge from receivership during the year of a Class III carrier, did not affect the overall picture as of the end of the year compared with the beginning.

Of the 97 companies in trusteeship or receivership at the end of 1941, 35 were Class I railways. Eight of these, operating 10,161 miles of road, were in receivership, while 27, operating 60,917 miles, were in trusteeship. A total of 72,750 miles of railroad, of all classes, was in receivership or trusteeship as of December 31, 1941, a net decrease of 2,520 miles during the year. This mileage represented 29.5 per cent of the total railway mileage of the United States.

Progress was made during 1941 in the reorganization of Class I carriers under Section 77 trusteeships. By the end of the year, the Interstate Commerce Commission had approved thirteen plans of reorganization, while examiners of the Commission had proposed three additional plans, which had yet to receive Commission approval. Approved plans include those for the Chicago & Eastern Illinois and the Chicago Great Western, whose trusteeship proceedings have been concluded. Among examiners' proposed plans were those for the Florida East Coast, transferred during the year from receivership to trusteeship. Thus a total of sixteen plans had reached the stage of final or tentative disposal by the Interstate Commerce Commission.

The more important developments during 1941 in trusteeship procedure affecting Class I railroads included issuance by Commission examiners of proposed reports on plans of reorganization for the Florida East Coast, the Minneapolis, St. Paul & Sault Ste. Marie, and the Denver & Rio Grande Western, the latter being a modification. A final report was rendered by the Commission in the case of the St. Louis Southwestern system, and modified reports for the New York, New Haven & Hartford; Chicago Rock Island & Pacific, and St. Louis-San Francisco. Court-approved plans were submitted to creditors and security holders for approval or rejection in the cases of the Chicago & North Western, Erie, and Missouri Pacific. Submission of a plan previously approved by the court for the Chicago, Milwaukee, St. Paul & Pacific is being held up by further court action on the part of protesting interests.

The courts confirmed, during the year, plans of reorganization approved by creditors and security holders in the cases of the Akron, Canton & Youngstown, Chicago & North Western, and Erie. In none of these cases has actual consummation of the plan been entirely completed. The Spokane International has received authorization for issuance of securities, assumption of obligations and liabilities, and acquisition of the debtor's property by the reorganized company, but proceedings have not yet been terminated.

Following the Commission's now well established policy with respect to treatment of equity holders, the plans proposed or approved in 1941 are characterized by elimination of equity holdings. The fact that most railroads now in process of reorganization are experiencing substantially increased earnings under the impetus of the present emergency, has not resulted in any appreciable relief for equity holders from the drastic effects of the so-called "wringer" method of financial rehabilitation.

Increasing evidence appeared in 1941 of a disposition on the part of debtor interests to question court approval of plans unsatisfactory to them, and of the courts to take a more active part in the development of final plans. Appeals from the decisions of district courts approving plans are now pending in the cases of the Chicago & North Western and the Missouri Pacific. Significant decisions were rendered by the Court of Appeals in cases carried to that court by the Chicago, Milwaukee, St. Paul & Pacific and the Western Pacific; in both instances, plans were returned to the Interstate Commerce Commission with instructions to make certain findings as to the value of the debtor's properties. The Commission-approved plans of the New York, New Haven & Hartford and the Denver & Rio Grande Western were rejected by the respective district courts and returned to the Commission for further consideration and revision.

With its findings in Ex Parte No. 138, "Opening Journal Entries for Reorganization of Chicago Great Western Railroad Company," the Interstate Commerce Commission resolved the problem of what disposition a reorganized company should make of the difference between its new capital structure and the amount on the books of the old company representing investment in the property. A previous decision by Division I of the Commission had imposed upon reorganized companies the necessity of writing down the investment account to conform to the limitations of the new capital structure. Compliance with the requirements of Division I presented serious accounting, taxing, and other difficulties. The matter was brought to issue by the Chicago Great Western, when it appealed from this decision to the full Commission. The Commission reversed the action of Division I, and prescribed a new asset account No. 702½, "Acquisition Adjustment," in which entries may be made reflecting the difference between the original cost of transportation property and its worth as found in reorganization proceedings. This decision largely supported the contention of objecting railroads, although serious taxing difficulties are still involved.

Railway Financing

Railway financing authorized by the Interstate Commerce Commission under the provisions of Section 20a of the Interstate Commerce Act, for the twelve months ended October 31, 1941, totaled $641,732,299, plus 179,000 shares of common stock without par value. These figures do not include notes or other obligations given by carriers to the Reconstruction Finance Corporation.

Equipment-trust obligations to finance the purchase of new equipment accounted for $275,359,000 of the capitalization authorized. This amount is $104,115,000 in excess of equipment-trust obligations authorized in the similar preceding period. Interest rates were slightly lower, the average rate being 1.83 per cent.

Indebtedness of rail carriers to the government decreased by $26,284,996 during the first ten months of 1941. As of October 31, 1941, the status of railway financing through government agencies was as indicated below:

Total loans (RFC and PWA)	$1,012,299,675
Repaid by railways	427,391,637
Balance, October 31	$584,908,038
Of which there had been disposed of to the public at a net profit of $5,019,815	129,664,000
Still held by government	$455,244,038

New borrowing during 1941 totaled $24,720,370. A total of $51,005,366 was repaid by carriers, and is in-

cluded in the total repayment of $427,391,637 shown above.

The Railroad Credit Corporation made liquidating payments aggregating 5½ per cent during 1941 to participants in its pool. As of December 31, 1941, a total of $62,074,528, or 84½ per cent, of the original loan fund had been liquidated by pro rata distributions to participants in the fund.

Railroad Retirement Board Operations

Railroad Retirement: Annuitants and pensioners on the rolls of the Railroad Retirement Board as of November 30, 1941, numbered 156,064 persons. Compared with the 148,884 on the same date in 1940, this represented a net increase of 7,180 annuitants. Pensioners (persons transferred from the voluntary rolls of the carriers in 1937) decreased by reason of 3,848 deaths, while the number of annuitants showed a net increase of 11,028.

Total annual benefit disbursements as of November 30, 1941, aggregated $119,403,108, which was $6,232,044 greater than on the same date in 1940. This net increase was after a reduction in annual disbursements to pensioners amounting to $2,635,620.

Due to rising employment and payrolls, total retirement tax accruals during 1941 increased substantially. For the ten months ended October 31, 1941, payroll tax accruals amounted to $111,500,000, which was $14,850,000, or 15.4 per cent, more than in the same period of 1940. The year 1941 as a whole will show an even larger relative increase because of taxes on the wage increases, retroactive to September 1. These wage increases will add materially to future retirement tax collections.

Briefly summarized, retirement tax accruals, interest, and expenditures for the entire period of operation from 1937 to November 30, 1941, are as follows:

Tax accruals		$600,000,000
Interest		8,748,000
		$608,748,000
Less:		
Benefit payments	$471,878,000	
Administrative expenses	17,018,000	488,896,000
Balance		$119,852,000

The item of $17,018,000 for administrative expenses includes $2,843,000 expended in connection with the acquisition of prior service and compensation data. The balance shown includes taxes accrued but not yet collected. It does not represent the actual balance to the credit of the Railroad Retirement Account, since appropriations to the account have exceeded tax collections. The actual balance as of November 30, 1941, was $176,219,527, of which $101,500,000 was invested in 3 per cent Treasury notes.

Railroad Unemployment Compensation: The rising trend of employment in 1941 aided in keeping down unemployment insurance benefit costs. On the other hand, benefit rates were liberalized by nearly 70 per cent on November 1, 1940, by reason of amendments to the law. These two contrary tendencies almost balanced each other in 1941. Benefit disbursements during the first ten months of 1941 amounted to $12,998,591, compared with $12,713,340 in the same period of 1940. As tax accruals during this period approximated $56,000,000, the amount to the credit of the unemployment insurance reserve continued to rise.

The following tabulation is a statement of receipts and expenditures in the Railroad Unemployment Insurance Account from July 1, 1939, the effective date of the unemployment compensation act, through October, 1941.

Receipts:		
Deposits by Railroad Retirement Board	$122,527,843	
Transfers from state accounts	105,900,769	
Transfers from administration fund	11,409,667	
Interest credited	3,266,108	
Total		$243,104,387
Expenditures:		
Benefit payments certified		34,657,303
Balance		$208,447,084

This statement excludes certain advances from and repayments to the Treasury. The item "deposits by the Railroad Retirement Board" represents 90 per cent of the payroll tax of 3 per cent on employers, collected by the Board and deposited with the Treasury; the remaining 10 per cent goes into a separate administration fund.

Highway and Waterway Developments

Congress appropriated $117,500,000 for the regular Federal-aid program of highway development throughout the United States, during the fiscal year 1942. In addition, $220,000,000 was appropriated on November 19, 1941, for defense purposes, such as the construction of access roads into camps and other government properties, strengthening of bridges and culverts for highway traffic, construction of flight strips, and other defense projects.

In the waterway field, Congress appropriated for 1942 a total of $172,412,065 for various developments, the more important items being $68,268,640 for existing river and harbor projects, maintenance, etc., $95,128,425 for flood control, and $9,015,000 for hydroelectric development at Fort Peck and Bonneville dams.

The House Committee on Rivers and Harbors held extensive hearings on two large waterway improvement projects, and a large number of less extensive projects. The two hearings related to the St. Lawrence waterway and power project, hearings regarding which extended from June 17 to August 6, and the Tombigbee-Tennessee project, which was heard in late March and early April.

The Tombigbee-Tennessee project contemplates improvement of the Tombigbee River and joining it with the Tennessee River, by a 20-mile canal, 115 feet wide and 12 feet deep. The cost is variously estimated at from $65,000,000 to $70,000,000.

The St. Lawrence project has been on the tapis for many years. A United States-Canada treaty authorizing it as a joint undertaking of the two countries failed of ratification by the Senate in 1934. It was revived by the present administration, labeled a defense project, and submitted to Congress for authorization by concurrent resolutions, thus attempting to bypass the necessity of obtaining a two-thirds vote of approval in the Senate on a treaty.

During hearings of more than seven weeks, a number of Cabinet members and other government officials appeared in favor of the St. Lawrence project as a defense measure. The defense aspects consist principally of the electric power to be derived from the project, and the possibility of building large naval and other ships in the Great Lakes and sending them out to the open sea by the enlarged channel. The defense argument was considerably weakened by the fact that construction of the project would, under the minimum or most favorable estimates, take four years to complete, and that Canada has not definitely committed herself to completing her share of the work before the end of 1948, a period of more than seven years.

Opponents of the project also appeared in considerable numbers, representing such important industries as coal producing and transportation, labor groups in those

same industries, and representatives of many cities and communities affected, such as New York, Philadelphia, Buffalo, Cleveland, Chicago, and others.

After the close of the St. Lawrence hearings, the President suggested to the committee that it submit an omnibus bill, including all the important projects which by any conceivable interpretation could be regarded as having a defense aspect. This suggestion was adopted by the committee, which on November 21 submitted such a bill to the House in its Report No. 1431, 77th Congress, 1st Session. The bill (H. R. 5993) would authorize some 236 projects, at an aggregate cost of approximately a billion dollars, including the following more important items:

St. Lawrence	$277,056,515
Florida Ship Canal	197,921,000
Tombigbee-Tennessee Waterway	66,000,000
Alabama and Coosa Rivers	60,000,000
Umatilla Dam (Columbia River)	49,470,000
Beaver & Mahoning Rivers	48,179,000
East River, New York	34,509,000
Snake River	30,200,000
Savannah River	28,000,000
Illinois waterway, etc.	25,900,000
Neches & Angeline Rivers, Texas	23,000,000
Trinity River	15,000,000

This device of an omnibus bill, in which were included a number of projects of doubtful value (such as the St. Lawrence, Tombigbee, Florida Ship Canal, Beaver-Mahoning, and Trinity), carried the House back to the old pork-barrel days, from which it has tried for some years to get away.

The committee's report on the bill was not unanimous, as ten of its 25 members joined in one or more of the three minority reports. The first report was a general indictment of the St. Lawrence project, and was signed by eight members of the committee. The second minority report, signed by five members, was in opposition to the Beaver-Mahoning project. The final minority report contained certain basic objections to the bill as a whole. Although agreeing that projects essential to national defense shall be authorized, it concluded that the bill as at present constituted should not be enacted. This report was signed by eight committee members.

The St. Lawrence project was approved for inclusion in the omnibus bill by a committee vote of 17 to 8. The Florida Ship Canal project was approved by a vote of 14 to 10.

Thirty-six projects in the bill were certified as necessary to national defense. Proponents of the bill have not yet sought to bring it up for debate.

The Competitive Situation

Competition between the several agencies of transport continued during 1941, but the transportation problem changed, temporarily at least, from one of surplus facilities to one of maximum utilization of existing facilities. While no shortage in transportation facilities occurred in 1941, except possibly a temporary stringency in the intercoastal movement of petroleum products to the eastern seaboard, occasioned by the transfer of some 50 American oil tankers to British service, the problem of moving promptly the large amount of traffic offered during the year tested the economic fitness of each of the several agencies in the field.

The total amount of transportation service rendered in the United States in 1941 exceeded all previous records. On a ton-mile basis, all modes of transportation —railroads, water carriers, motor trucks, pipelines, and airlines—attained all-time peaks in the handling of freight traffic. The combined freight movement of all five agencies aggregated 750 billion ton-miles in 1941, compared with 615 billion ton-miles in 1940. In passenger service the five carriers performed 56 billion passenger-miles in 1941, contrasted with 47 billion for 1940.

Of the increase in freight movement of approximately 135 billion ton-miles, 1941 over 1940, the railroads accounted for about two-thirds, thus holding their own in the competitive race for freight traffic. Commercial airlines again made impressive gains in traffic during the year, although they still handle a relatively small percentage of the nation's transportation business.

Ore movements on the Great Lakes supplied an outstanding example of co-ordinated rail-water movement. Prior to 1941, the record movement took place in 1929, with 69,367,000 *net* tons. This was closely approached in 1940 with 68,700,000 tons, and was considerably surpassed in 1941, with more than 80,000,000, *gross* tons.

During the year, a number of significant developments took place affecting those agencies of transport with which the railroads are in competition. The Interstate Commerce Commission, acting under the powers conferred on it by the Transportation Act of 1940, continued to enlarge and perfect the procedure of regulating common and contract water carriers. Further regulations were issued covering freight and passenger rates of, and extension of credit by, such carriers.

In the field of highway transport, industry committees were appointed for the passenger motor carrier and the property motor carrier industries, under the provisions of the Wage and Hour law, for the purpose of recommending to the Administrator minimum wage scales for the 750,000 employees in those industries. In both instances, a minimum hourly rate of 40 cents was recommended. That for the motor bus industry has been confirmed by the Administrator, to become effective January 5, 1942. Final action on the motor truck committee's recommendation to the Administrator on September 12 is still pending.

A nation-wide inventory of all trucks and busses in the United States was initiated September 25 under the auspices of the Federal Works Administration. Card questionnaires were mailed to each truck and bus owner. The results of the survey have not yet been announced.

Following the refusal of the Interstate Commerce Commission in November, 1940, to approve the merging of 56 highway carriers under a holding company, eight large over-the-road common carrier highway truck lines, members of the former group, which operate along the Atlantic seaboard from Maine to Florida, renewed their application to the Commission on July 25, 1941, for permission to merge. Early in December, Examiner Vernon V. Baker of the Bureau of Motor Carriers rendered a report recommending that such a merger be approved. The Commission has yet to act upon the Examiner's recommendation. The eight lines involved in the application operate a total of 3,320 motor vehicles and employ between 6,000 and 7,000 persons.

Since the enactment of the "Pipe Line" law, previously described, two authorizations for construction of petroleum pipelines have been extended to private companies, including authority to exercise the right of eminent domain. In addition, Petroleum Co-ordinator Ickes recommended the immediate construction by the oil industry of a $70,000,000 pipe line system that would carry some 250,000 barrels of crude oil daily from western and southwestern oil fields to the East Coast. This latter project is at present dormant, due to refusal by defense authorities to allocate to the undertaking the necessary steel.

An impending oil shortage on the eastern seaboard during the late summer was relieved by increased use of rail transport for oil products, such action being facili-

tated by an appreciable adjustment in rates which lowered the cost of this transportation.

Much thought and study was devoted during the year to the competitive situation of the future. Informed students agree that at the conclusion of the war the country will have available a substantial surplus of transportation facilities. Many believe that it is not too early, even now, to plan to set up such measures as may tend to avoid, or at least alleviate, the drastic readjustment that will otherwise follow the current, and probably temporary, abnormal upswing in the volume of our national traffic.

Principal Operating Factors

The following summary compares the statistical results of railway operation in 1941 with the corresponding results for 1940. The summary is followed by a more detailed discussion of the several factors. All the statistics in this and succeeding statements relate to railways of Class I, and all of them are necessarily the result of partial estimates, as this article is prepared before the close of the year. As a matter of fact, so many uncertainties as to traffic, wage rates, and earnings entered the picture toward the end of the year 1941 that final estimates for the year have been made with great difficulty, and are to be considered as approximate for the time being, subject to revision when complete returns become available.

1. Freight traffic (ton-miles) increased 25.9 per cent over 1940, while passenger traffic (passenger-miles) increased 22.1 per cent.

2. Operating revenues in 1941 increased 23.9 per cent over 1940. Freight revenue showed an increase of 25.3 per cent, while passenger revenue increased 22.3 per cent.

3. Total operating costs (operating expenses, taxes, and operating rentals) amounted to $4,345,000,000 in 1941, compared with $3,615,000,000 in 1940, an increase of 20.2 per cent.

4. Railway taxes increased in 1941 to a total of $550,000,000. This was an increase of 38.9 per cent over 1940, and broke all records, both as to amount and as to ratio to revenues. The next largest tax year was 1929, when tax accruals aggregated $397,000,000. The ratio of taxes to revenues in 1941 was 10.3 per cent, thus exceeding the previous high ratio of 9.5 per cent, in 1938.

5. Net railway operating income amounted to $980,000,000 in 1941, an increase of 43.7 per cent over 1940.

6. Net income after fixed charges in 1941 amounted to $485,000,000, compared with $189,000,000 in 1940.

Traffic and Revenue Trends

Table I summarizes the levels of railway freight and passenger traffic for each of the years 1937 to 1941, and for the years 1929 and 1932. The entries for 1929 supply a background of comparison, while those for 1932 generally measure the low points of the depression period. Freight traffic is shown in terms of both carloadings and revenue ton-miles.

Table I—Comparative Traffic Statistics

Revenue Car Loadings (Thousands)	
1941	42,250
1940	36,358
1939	33,911
1938	30,457
1937	37,670
1932	28,180
1929	52,828
Revenue Ton-miles (Millions)	
1941	470,000
1940	373,253
1939	333,438
1938	290,084
1937	360,620
1932	233,977
1929	447,322
Revenue Passenger-miles (Millions)	
1941	29,000
1940	23,752
1939	22,651
1938	21,629
1937	24,655
1932	16,971
1929	31,074

Revenue carloadings in 1941 aggregated 42,250,000 cars, an increase over 1940 of 5,892,000 cars, or 16.2 per cent. The rate of increase showed a sharp decline in April, during the bituminous coal mine strike, and reached its highest relative level in March, May and June, with a declining rate of increase thereafter. These trends are outlined on Chart A, which shows average

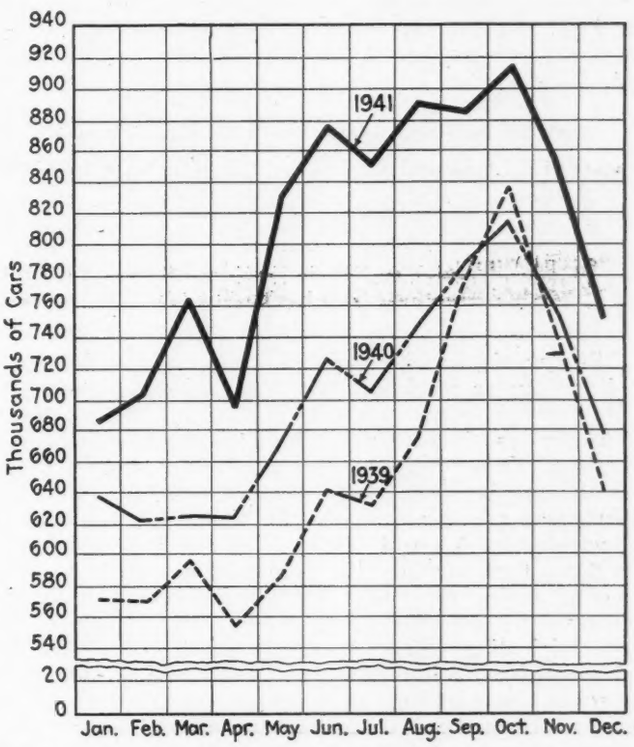


Chart A—Average Weekly Freight Carloadings By Months, 1939, 1940 and 1941

weekly carloadings in each month of 1939, 1940, and 1941.

Table II distributes the carloadings of 1941 among eight commodity groups, according to the classification adopted and used by the Car Service Division of the Association of American Railroads. The increase over 1940 (or decrease) for each group, and the percentage of change, are also shown:

Table II—Carloadings, by Groups of Commodities (Thousands)

	1941	Increase over 1940 Number	Per cent
Miscellaneous	18,375	3,533	23.8
Mdse, L. C. L.	8,065	386	5.0
Coal	7,610	790	11.6
Ore	2,683	535	24.9
Forest Products	2,183	383	21.3
Grain and products	2,006	171	9.4
Coke	678	129	23.5
Live Stock	650	Dec. 35	Dec. 5.2
Total	42,250	5,892	16.2

Because of wide variations in the rate of increase, 1940 to 1941, two shifts occurred in the relative positions of the groups. Forest products, which in point of volume stood sixth in 1940, moved into fifth place in 1941, exchanging places with grain and its products. Similarly, live stock stood seventh in 1940 but dropped into eighth and last place in 1941, exchanging places with ore.

The influence of war and defense activities on the character of railway freight traffic is clearly shown in these statistics. The largest carload increase took place in manufactured and miscellaneous articles. Heavy relative increases also occurred in four groups closely related to and serving the heavy industries—namely, coke, forest products, ore, and coal. Merchandise took a moderate upward turn, for the first time in several years, with the sole exception of 1939.

Variations also occurred as among the several regions of the United States. As against an overall increase of 16.2 per cent in carloadings for the industry as a whole, regional increases ranged from a low of 8.3 per cent to a high of 21.6 per cent, as indicated in Table III below. The relative increases from 1939 to 1940 are also shown.

Table III—Percentage Increases in Carloadings, by Regions

Region	1941 over 1940	1940 over 1939
Allegheny	21.6	13.3
Eastern	16.7	5.7
Northwestern	15.9	10.8
Southern	15.8	4.8
Southwestern	14.6	1.1
Central Western	12.9	1.3
Pocahontas	8.3	12.7
Total	16.2	7.2

Survey of this table makes it clear that certain areas of the country continued to derive relatively large benefits from the defense program, in 1941 as in 1940. This was the case in both the Allegheny and Northwestern regions. Other regions, which received a comparatively small stimulus from that program in 1940, began to benefit on a larger scale in 1941. This was true of the Southwestern, Central Western, Eastern and Southern regions, thus fulfilling the prediction we made in our annual review for 1940. Not all the benefit from an increase in carloadings originated inures, of course, to the originating region; to the extent that the cars so originated move into and across other regions, the carriers in those regions participate in the revenue.

Revenue ton-miles in 1941 exceeded those of any previous year, surpassing the former record year of 1929 by 5.1 per cent. The spread between ton-miles and carloadings continued to widen, the increase from 1940 to 1941 being 25.9 per cent as to ton-miles, and 16.2 per cent as to carloadings. Passenger-miles in 1941 were greater than in any year since 1929.

Financial Results

A summary of the financial results of operation of Class I rail carriers in 1941 appears in Tables IV to VIII, following. This summary is drawn, as to 1941, from estimates based on monthly reports; for the year 1940 and 1930, with which 1941 is compared, the returns are those of annual reports.

Table IV—Condensed Income Account

	1941 (Millions)	1940 (Millions)	1930 (Millions)
Total operating revenues	$5,325	$4,297	$5,281
Total operating expenses	3,660	3,089	3,931
Tax accruals	550	396	349
Net railway operating income	980	682	869
Net income (after fixed and contingent charges)	485	189	524

Compared with 1940, operating revenues in 1941 increased 23.9 per cent, operating expenses 18.5 per cent, and net railway operating income 43.7 per cent. The operating ratio declined from 71.9 per cent in 1940 to 68.7 per cent in 1941. Both the operating expenses and the operating ratio in 1941 reflected the wage increases for only four months, and at a lower average rate of increase than will apply throughout the year 1942.

Taxes deserve particular mention. Prior to 1941, the largest amount of taxes accrued by rail carriers in any one year was $396,683,000. This was in 1929. Taxes then fell off continuously to $236,945,000 in 1935, although the ratio of taxes to gross revenues showed an increase over that period, from 6.3 per cent in 1929 to 6.9 per cent in 1935. The decline in aggregate taxes grew largely out of the sharp fall in taxable income, thus reducing Federal and state income taxes. Beginning with 1936, payroll taxes entered the picture, and the gradual increase in that form of taxation, together with an improved income position in the last three years and higher income tax rates, has brought total taxes up to a new high level. Railway tax accruals reached $396,395,000 in 1940, almost equalling the total for 1929, and in 1941 far surpassed the 1929 and 1940 levels, rising to $550,000,000. The increase was due principally to a combination of three factors: Greater employment and higher wage rates, leading to an increase in payroll taxes from $116,439,000 in 1940 to $130,000,000 in 1941; an increase in taxable net income; much higher income tax rates, under the Revenue Act of 1941.

Operating Revenues

Operating revenues of all classes increased from 1940 to 1941, as shown in Table V, below:

Table V—Operating Revenues

	1941 (Millions)	1940 (Millions)	1930 (Millions)
Freight revenue	$4,432	$3,537	$4,083
Passenger revenue	510	417	730
Mail revenue	108	101	111
Express revenue	60	56	115
All other	215	186	242
Total	$5,325	$4,297	$5,281

The greatest increase from 1940 to 1941 took place in freight revenue, or 25.3 per cent, while passenger revenue increased 22.3 per cent. Total operating revenues showed an increase of 23.9 per cent.

While total revenues for 1941 were slightly above those of 1930, they were less than the $6,280,000,000 earned in 1929 by nearly a billion dollars.

Operating Expenses

Table VI distributes total operating expenses into its several principal groups, comparing 1941 with 1940 and with 1930.

Table VI—Operating Expenses

	1941 (Millions)	1940 (Millions)	1930 (Millions)
Maintenance of way	$600	$497	$706
Maintenance of equipment	990	819	1,019
Traffic	115	107	128
Transportation	1,760	1,501	1,848
General and other	195	165	230
Total	$3,660	$3,089	$3,931

Maintenance again showed the greater relative increases. Compared with an overall increase of 18.5 per cent in operating expenses, maintenance of way and of equipment each showed an increase of 20.9 per cent. The two maintenance accounts combined thus increased

20.9 per cent, while transportation expenses increased 17.3 per cent.

Net Earnings and Rate of Return

The rate of return on property investment (including road and equipment, cash, material and supplies) in 1941 was 3.72 per cent.

Table VII shows the net railway operating income, and the rate of return on property investment, for the years 1929 and 1930, and for each of the nine years from 1933 to 1941, inclusive.

Table VII—Return on Investment

Year	Net Railway Operating Income	Rate of Return (Per Cent)
1941	$980,000	3.72
1940	682,133	2.59
1939	588,829	2.25
1938	372,874	1.43
1937	590,204	2.27
1936	667,347	2.57
1935	499,819	1.93
1934	462,652	1.78
1933	474,296	1.82
1930	868,879	3.28
1929	1,251,698	4.81

For the first time since 1930, a period of eleven years, the rate of return exceeded 3 per cent in 1941. During the ten intervening years, 1931 to 1940, the rate ranged from a low of 1.24 per cent, in 1932, to a high of 2.59 per cent, in 1940, a record of subnormal earnings over so long a period as a decade. Even with the improved earnings of 1941, the rate of return on investment in that year did not reach 4 per cent.

The corresponding rates of return on investment for the three districts were as follows: Eastern District, 3.90 per cent in 1941 and 3.06 per cent in 1940; Southern Region, 4.30 per cent in 1941 and 2.57 per cent in 1940; Western District, 3.40 per cent in 1941 and 2.08 per cent in 1940.

Revenue per Traffic Unit

Average revenue per ton-mile and per passenger-mile continued to show slight declines in 1941. No general readjustments in freight and passenger rates occurred during the year. In the freight field, continued demand for movement of heavy commodities moving long distances, such as iron ore, coal and coke, and iron and steel products, had its effect on the average per ton-mile.

Table VIII shows the average revenue per ton-mile and per passenger-mile for the years 1921, 1931, and for each year from 1935 to 1941.

Table VIII—Revenue per Traffic Unit

Year	Per Ton-Mile (cents)	Per Passenger-Mile (cents)
1941	0.942	1.753
1940	0.945	1.754
1939	0.973	1.839
1938	0.983	1.874
1937	0.935	1.794
1936	0.974	1.838
1935	0.988	1.935
1931	1.051	2.513
1921	1.275	3.086

Revenue per ton-mile in 1941 was lower than in any year since 1918, save only 1937. Revenue per passenger-mile in 1941 was the lowest on record; in fact, the average revenue in each of the last six years, 1936 to 1941, inclusive, has been lower than in any year prior to 1936.

Capital Expenditures and Purchases

Table IX shows the gross expenditures made by Class I rail carriers for capital improvements, and for the purchase of material and supplies (including fuel), in each of the ten years from 1932 to 1941, inclusive. The entries in this table for 1941 are subject to change, inasmuch as returns for the year are not available as this is written.

Table IX

Year	Capital Expenditures	Purchases of Materials and Supplies
1941	$600,000,000	$1,075,000,000
1940	429,147,000	854,463,000
1939	262,029,000	769,314,000
1938	226,937,000	583,282,000
1937	509,793,000	966,383,000
1936	298,991,000	803,421,000
1935	188,302,000	593,025,000
1934	212,712,000	600,224,000
1933	103,947,000	465,850,000
1932	167,194,000	445,000,000
Total—ten years	$2,999,052,000	$7,155,962,000

While gross capital expenditures and railroad purchases both increased in 1940 and again in 1941, as a result of the defense and war stimulus, the annual averages for those years remained far below the annual averages of the eight years from 1923 to 1930. Capital expenditures averaged $842,715,000 per year in the 1923-30 period, and $514,573,000 per year in 1940-41. Purchases averaged $1,383,517,000 per year in 1923-30, and $964,731,000 per year in 1940-41. Prices averaged somewhat less in 1940 and 1941 than in 1923-30, but this factor probably accounts for a minor part of the lower expenditures of the past two years.

Capital expenditures for the nineteen years 1923 to 1941 aggregated $10,102,680,000, or $531,720,000 per year. Railroad purchases over the same 19-year period aggregated $18,919,099,000, or $995,742,000 per year.

Equipment Installations

Table X shows the number of units of equipment installed by Class I carriers during each of the years 1937 to 1941, inclusive, and in 1930 as well. The table includes also the number of units under construction at the close of each of those same years.

Table X—Equipment Installations

(Railroad owned or controlled equipment)

	Installed during year	Under Construction Dec. 31
Steam locomotives:		
1941	136*	281†
1940	126	115
1939	100	51
1938	164	30
1937	373	131
1930	782	120
Electrics and Diesels:		
1941	421*	291†
1940	293	91
1939	220	66
1938	118	41
1937	77	30
Freight cars:		
1941	72,440*	76,942†
1940	65,545	35,702
1939	24,528	37,099
1938	18,517	5,080
1937	75,058	7,947
1930	76,909	9,821

* Eleven months only. † As of November 30.

Railroads carried forward into 1942 a larger bank or carryover of steam locomotives under construction than at the close of any year since 1929.

As to Diesel and electric locomotives, a motive power field that has developed rapidly in recent years, the carriers installed more units in 1941 than in any previous year, and had more units under construction at the end of the year (291 on December 1) than at the close of any previous year.

Freight car installations in 1941 exceeded those of any year since 1929, and the carryover into 1942 of cars under construction was greater than in any one year since 1928.

Stored serviceable locomotives averaged 1705 during

1941, compared with 2,760 in 1940. The serviceable freight car surplus in 1941 ranged from a minimum of 40,591 in October to a maximum of 190,318 on May 1, compared with a range of from 74,977 to 190,370 in 1940.

Operating Efficiency and Economy

Railroads maintained, and in several respects improved, the fine record for efficiency and economy of operation which they achieved in 1940.

Several of the more significant factors are outlined in succeeding tables. The tables cover the five years from 1937 to 1941, include comparative statistics for the year 1931, ten years ago, and for the year 1922, the last complete year preceding the railroad efficiency program of 1923.

Table XI shows the average number of gross ton-miles, and net ton-miles, per freight train-hour. The gross figures include, while the net figures exclude, the tare weight of the freight cars in the train.

Table XI—Ton-Miles per Train-Hour

Year	Gross T. M.	Net T. M.
1941 (10 mos.)	34,814	14,977
1940	33,808	14,027
1939	32,808	13,450
1938	31,141	12,473
1937	30,349	12,695
1931	26,721	10,825
1922	16,188	7,479

This table, showing continuous increase in the average number of both gross and net ton-miles handled per freight train-hour, speaks for itself. The record has been broken year after year for several years, was surpassed in 1940, and again in 1941.

Table XII shows the average daily performance of active locomotives and freight cars. Active locomotives are serviceable units, less those reported as stored. Active freight cars are serviceable units, less surplus units.

Table XII—Locomotive and Car Performance

Year	Miles per Day per Active Unit: Freight locomotives	Passenger locomotives	Freight cars
1941 (10 mos.)	116.2	196.2	45.8
1940	107.2	189.8	42.6
1939	104.1	184.3	41.3
1938	99.0	178.0	39.0
1937	104.5	177.0	40.6
1931	88.2	164.5	37.3
1922	79.3	140.3	29.6

The fine achievement of rail carriers in 1940 and 1941, in respect of these factors of equipment performance, is brought out in this table. Both years showed record-breaking results.

The next table, Table XIII, shows the average speed of freight and passenger trains, in miles per hour.

Table XIII—Average Train Speed

Year	Freight trains	Passenger trains (locomotive propelled)
1941 (10 mos.)	16.5	37.7
1940	16.7	37.3
1939	16.7	36.9
1938	16.6	36.2
1937	16.1	36.0
1931	14.8	*
1922	11.1	*

* Not reported.

Traveling 24 hours in a day at the average speed reported in 1941, a freight train would cover a total distance of 396 miles, and a locomotive-propelled passenger train (exclusive of rail motor cars) a total distance of 905 miles. Fast freight and passenger expresses, of course, do much better than this. For example, the Baltimore & Ohio overnight freight between Jersey City and Pittsburgh covers 525 miles in 765 minutes, at the rate of 988 miles per 24-hour day. Similarly, the merchandise special leaving Chicago for Memphis every night over the Illinois Central does 527 miles in 770 minutes, or at the rate of 986 miles per day. The Congressional Limited of the Pennsylvania takes passengers over the 226 miles between New York and Washington in 215 minutes, or at the rate of 1,514 miles per day. Several long distance passenger trains between Chicago and the West Coast make the run in 39¾ hours; the distance varies from 2,227 miles to 2,272 miles, according to the particular route, and the average speed ranges between 56 and 57 miles per hour, or from 1,344 to 1,368 miles per day.

Table XIV shows the growing load per freight train and per freight car. All trainload records were surpassed in 1941, and by a wide margin. The carload average was also a record.

Table XIV—Average Freight Train and Car Load

Year	Net tons per train	Net tons per car
1941 (10 mos.)	915	28.4
1940	849	27.6
1939	813	26.9
1938	759	26.1
1937	796	27.1
1931	733	25.7
1922	676	26.9

The last table, dealing with economy, shows statistics of locomotive fuel performance. These appear in Table XV, which follows:

Table XV—Locomotive Fuel Performance

Year	Gross ton-miles per ton of fuel (Freight service)	Passenger train car-miles per ton of fuel (Passenger service)
1941 (10 mos.)	18,314	135
1940	17,839	133
1939	17,774	135
1938	17,462	134
1937	17,133	133
1931	16,740	138 *
1922	12,273	112

* Excludes electric power consumption, thus not wholly comparable with other years in table.

Here, again, was record efficiency. Fuel performance in freight broke all records by a considerable margin, and in passenger service was close to record levels.

Employees and Their Wages

The wage movement of 1941 and its results have been described in an earlier section of this review. In considering the average earnings of railway employees in 1941, it should be remembered that the wage increases they obtained became effective only in part from September 1 to November 30, and in full only during the month of December. For this reason, averages for the year 1941 only partially reflect those increases.

Railway employment averaged a total of 1,140,000 persons in 1941, an increase of 11.0 per cent over the corresponding average of 1,027,000 in 1940. The trend over the year was generally upward, from a minimum of 1,018,095 in January to a maximum of 1,217,750 in October; compared with 1940, the increase was 7.7 per cent in the first six months of the year and 14.1 per cent in the second six months.

The railroad payroll aggregated $2,300,000,000 in 1941, compared with $1,964,000,000 in 1940 and $1,863,000,000 in 1939. Thus the payroll increased 17.1 per cent, compared with an increase of 11.0 per cent in employment.

Annual earnings per man increased from $1,913 in 1940, calculated on the basis of the mid-month count of employees, to $2,018 in 1941. This average will be higher in 1942, exceeding $2,100 per man per year by an appreciable margin. Average compensation per hour paid for increased from 75.1 cents in 1940 to 78.0 cents

in 1941 and will increase to approximately 85 cents in 1942.

Table XVI shows the average number of employees and their aggregate and average compensation in each of the 5 years, 1937 to 1941, and in 1930.

Table XVI—Employees and Their Compensation

	Average Number	Total Compensation (000)	Average Compensation Per Employee	Average Compensation Per Hour (cents)
1941	1,140,000	$2,300,000	$2018	78.0
1940	1,026,848	1,964,125	1913	75.1
1939	987,675	1,863,334	1887	74.9
1938	939,171	1,746,141	1859	75.0
1937	1,114,663	1,985,447	1781	70.9
1930	1,487,839	2,550,789	1714	67.8

Safety of Railway Operation

Experience shows that during periods of rising traffic volume, railroad accidents tend to increase at a rate somewhat greater than the rate of increase in traffic movement. Similarly, in a period of declining traffic, railroad accidents tend to decrease at a greater rate than the decrease in traffic movement. This in no way detracts from the long-time trend in improved safety conditions on the railroads. It merely emphasizes the fact that in measuring progress in safety, consideration must be given to differences in traffic movement for the periods compared.

The year 1941 was one of sharply increasing traffic volume, both freight and passenger. Accident and casualty frequency rates also increased, but probably will be no greater than in 1936 and 1937, years of similar, but not as great, traffic movement.

The train accident rate in 1941 should not be compared directly with the rates for either 1938, 1939 or 1940 and the conclusion drawn that the higher rate in 1941 indicates reduced safety. A better understanding of the significance of the 1941 rate (which figures for the first nine months indicate will be in the neighborhood of 6.00 per million locomotive-miles for the year as a whole) is obtained when comparison is made with the rates of 6.27 in 1936 and 6.15 in 1937, the most recent years of comparatively heavy traffic movement. Even that comparison is not exact, because locomotive-miles in 1941 are likely to exceed those of 1936 and 1937 by from 7½ to 10 per cent or more. Viewed in its proper perspective, the train accident experience in 1941 insofar as statistics for the first nine months of the year show, has been about what would be expected during a period of increasing traffic movement, and in fact shows better results than either 1936 or 1937, years of similar, but not as great, traffic movement.

Similar to the train accident showing, casualties to employees on duty show increases during the first nine months of 1941 over the same months of 1940. The fatality frequency rate increased 18.1 per cent and the injury rate 22.4 per cent for each million man-hours worked. If these rates of increase hold for the last three months of 1941, the fatality and nonfatal injury rates for the year will be about the same as in 1936 and 1937, although greater than in 1938, 1939 or 1940, years of lesser traffic movements.

Passenger safety during the first nine months of 1941 was on a comparatively high plane, there having been 58 fewer deaths and an increase of only 7.0 per cent in injuries, compared with an increase of 21.4 per cent in passenger-miles.

The progressive work of eliminating the more dangerous highway grade crossings is showing results. The record for the first nine months of 1941 shows an increase of 13.7 per cent in locomotive-miles, but increases of only 7.6 per cent in fatalities, and 9.1 per cent in nonfatal injuries in highway crossing accidents. This increase of 7.6 per cent in grade crossing fatalities may be compared with an increase of 17.0 per cent in all deaths attributable to motor vehicles in the same period.

Conclusion

Plunged into this all-out world war at the close of the year 1941, the United States and its people face an immediate future crowded with uncertainties. No one can foretell the exact trend of events in 1942, and thereafter, and speculation on the possibilities would be an idle and fruitless undertaking.

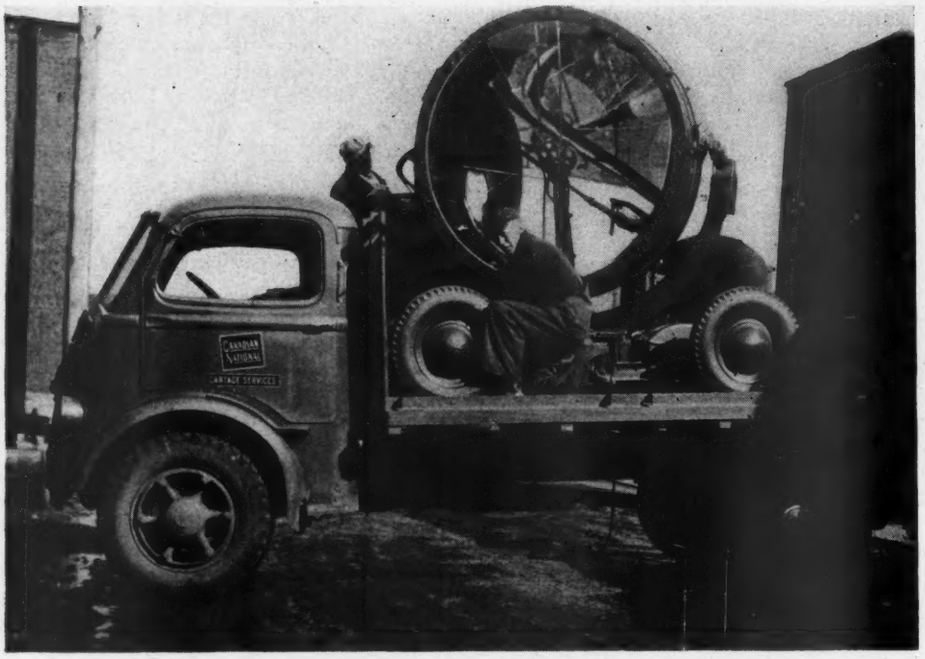
One thing only is certain. The American nation is in for a fight, a real fight, a tough fight, perhaps a long fight. The process of war-making will be extended and speeded up in its every phase. The cost of the war to the people of the United States is estimated as high as 150 billions, a truly astronomical figure. Additional camps and industrial plants are being planned. Troops will move to and from the camps in increasing numbers. Materials must move to plants making war goods, and the supplies and munitions of war must flow out at an accelerating pace. Transportation lies at the base of all such movements, and railroads and other agencies of transport will be called on for a large and increasing demand for service.

As the year closed, the President by executive order set up an Office of Defense Transportation, and named as director Mr. Joseph B. Eastman, chairman of the Interstate Commerce Commission and former federal co-ordinator of transportation. The new agency will be part of the President's executive office and its chief functions will be to co-ordinate government policies and activities affecting transportation, to make estimates of transportation requirements, and to co-ordinate domestic traffic movements. There will be separate divisions in the office for each mode of transport.

Co-operation of all factors involved will enable the carriers to do their share, as they surely will, in order that this war can and will be won.

* * *

Chesapeake & Ohio Passengers Travel by Boat Between Norfolk, Va., and Newport News. The "George Washington" Is Here Shown About to Depart From the old Passenger Pier at the Latter Point, which was replaced by a modern brick station in 1940



A Searchlight Gets a Ride on a C. & D. Truck

Photos Courtesy C. N. R.

Canada's Railways' 3rd War Year

Unprecedented traffic volume efficiently handled and railways are also manufacturing munitions

By Railway Age's Correspondent in Ottawa

THE cumulative expansion of the Dominion's war traffic over a period of 28 months produced inevitably a larger increase of business for Canada's railways in 1941 than in 1940.

It is estimated that the Canadian National will have shown at the end of 1941 a net operating revenue of $66,000,000, and while no estimate was available from the Canadian Pacific at this writing it is known that its showing was not far behind that of the publicly-owned road. A net revenue of $66,000,000 for the Canadian National means that it will more than have paid its way in 1941, for there will still remain a favorable balance after interest on all obligations in the hands of the public has been paid. The company came near to paying its way in 1940, when its operating net was double that of the previous year.

Whatever the net financial results of the railways, however, the service they have rendered to this nation at war was so steady, so widespread and in the face of such odds that some sort of distinguished service medal should be struck for the faithful thousands who have operated freight and passenger trains in all kinds of weather, with no equipment to spare and the exceeding difficulty in getting full crews for trains and adequate maintenance personnel.

Another important service given by the Canadian railways is in a direct form. There are many shops of both roads, from the Atlantic to the Pacific, that are producing in large quantities important war supplies. Gun carriages, naval guns and gun mountings are being made in Canadian National shops, and in the Angus shops of the Canadian Pacific at Montreal are being constructed the indispensable tanks, used in North Africa and in the Far East. How the two roads have suffered from the drain on their personnel is another story. It is probable that the aggregate loss of employees who have gone into the various defense services is close to 7,000, which is a lot of people when there is kept in mind the vastly enlarged need for trained personnel in this essential means of transportation.

Passenger Traffic Is Heavy Too

Up to the middle of December, 1941, cumulative carloadings were almost 14 per cent above 1940, and more than 25 per cent above 1939. In some areas, however, freight business has more than doubled and passenger business almost trebled. Troop trains have multiplied rapidly and the number of passengers handled on regular passenger trains has increased greatly, because many members of the defense forces travel by regular trains (a large number of these running in from two to five sections) and a larger number of civilians are also traveling, many because of kinship to the troops. So heavy has been the demand on a really limited supply of car and motive equipment that this Christmas season all travel on passes, except for members of parliament and the legislatures of the provinces, was banned. This was done to provide adequately for holiday travel of troops to their homes.

Both freight and passenger terminal facilities in the larger centers are being used to capacity. Strenuous efforts to get quicker loading and unloading of freight cars have helped considerably, but even the most pro-

gressive terminal handling is hard pressed to keep ahead of requirements. There has been a considerable new terminal trackage laid, and some double-tracking of main lines, especially in the Maritime provinces which, until recently, were the only funnel of munitions and troop movement by rail. Now with the Pacific another center of activity, the demand on rail facilities has been further intensified, and at the season of the year when operating conditions are at their worst.

The much debated new Canadian National terminal in Montreal will be ready for passenger business in the spring. Its final cost will be about $30,000,000, and it will provide for centralizing the C. N. R.'s passenger traffic in the heart of the city, with passenger yards established at Point St. Charles.

For the twelve months of 1941 it is estimated the revenue freight cars loaded will total 3,175,000, as compared with 2,826,986 actually loaded in the previous year. The largest increases were in miscellaneous commodities, in l.c.l., lumber, and pulp and paper. All but the last class reflect the large increase in war business. A tremendous volume of lumber has been moved in almost every province for the construction of defense plants and of various kinds of housing for the troops—while war weapons and ammunition were transported, in many cases across the continent, under the classification of Miscellaneous and l.c.l.

Still another large factor in the substantial expansion of freight moved by the railways was the rapid growth in the volume of foodstuffs moved to the seaboard for carriage to Britain. Canada's farms have contracted to supply unprecedented quantities of dairy products, meats and grain products to the United Kingdom, and as each contract is filled new contracts for larger quantities are concluded. One illustration of this is found in the supply of meats. A contract to provide Britain with 425,000,000 lb. of pork products was completed last fall. Immediately a new contract became effective, calling for the production and delivery of 600,000,000 lb.

This increased farm production has augmented railway traffic both coming and going. The carriers are called on to move the finished product and, also during the current winter, will haul a large volume of Western feed grain to livestock raisers in Ontario and Quebec, because of the crop failure in Ontario last fall. The Dominion government is assuming the transportation cost of this feed grain movement from the head of the Lakes to Ontario points. Recently the board at Ottawa named to enforce the Dominion's "ceiling" on prices and wages ruled that the railways this winter could continue their practice of raising rates for the winter season on traffic moved by boats on the Great Lakes during the navigation season. This will mean continuance of the normal winter advance in rates on package freight and also on grain, so the Dominion government will be paying an increased charge on feed grain moved by the railways from the head of the Lakes to Ontario points this winter.

Bonus Avoids Wage Controversy

A considerable addition to the expenses of the two roads has come from the compulsory cost-of-living bonus (granted to employees in lieu of a wage increase) and of the employers' shares of the national unemployment insurance. The latter in the six months of 1941 in which the scheme was operative cost the two roads an aggregate of at least $800,000. The Canadian National contribution was made on the basis of 68,400 employees, and the Canadian Pacific on the basis of about 47,000.

The railways were the first employers to pay the cost-of-living bonus (which adds $1.25 to weekly wages for each rise of 5 points in the cost-of-living index number). Early last year when it became evident that the American railway unions would open a drive for higher pay, it was considered in Canada to be good policy to put into effect as a war measure the bonus plan, which would protect employees without the necessity for prolonged and disturbing wage negotiations. It was conceived by Dr. Bryce Stewart, Deputy Labor Minister, with long training in similar problems in the United States. After the plan was applied to the Canadian railways it was gradually extended to other forms of employment, and, near the end of 1941 it was made nation-wide and compulsory as the only means of maintaining the "ceiling" on wages for the duration of the war.

In his year-end statement, Sir Edward Beatty, chairman and president of the C. P. R., stressed the "realiza-

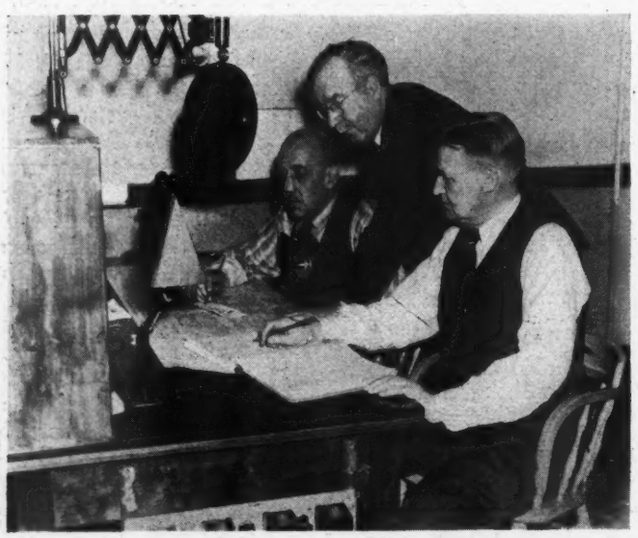
Army Trucks Double-Decked in Gondolas

tion of danger ahead," but went on to say that "Canadians should have a keen appreciation of the nation's increased power to meet that danger, as compared with what it possessed even at the end of the last great war." Continuing, he said, "the intervening 23 years have given us an approximate increase of 3,500,000 in population. We have come through alternating periods of great prosperity and pronounced depression, and through it all our industries have expanded, our foreign commerce has made important progress, the borders of our uninhabited and unproductive areas have been pushed farther and farther North, and the average standard of living of our people has been maintained, or even raised. Thus, if the danger which faces Canada today is greater than that presented a quarter of a century ago, the country is better equipped to cope with it in the matter of resources, in national wealth and in the number of workers in all ranks and stations of life, ready and able to direct those things toward the national war effort.

Last War's Experience Helps

"Two factors mainly have contributed towards the successful carrying out of these war-time tasks. In the first place we have not failed to profit by the experience gained in the last great war. We entered this struggle with a fairly clear view of what we should later be called upon to do. We did not then foresee the immensity of the task ahead, but we did know what methods of operation had proven effective under somewhat similar circumstances.

"Another factor which has contributed to the maintenance of the railways' high standard of performance is found in the unfailing attention which has been paid to increasing their capacity and efficiency as the years have passed. Canadian railroads today present a vastly different picture from that of a quarter century ago. Abnormal traffic demands of boom times, the necessity for economical operation in periods of depression and the inspiring spur of new and varied competition have set keen minds to work on problems the answers to which



A New C.N.R. Dispatcher's Office at Hamilton

are seen in the unprecedentedly high state of efficiency at which they are now operating.

"The railways are busy—more so than they have been for many years. All available Canadian Pacific locomotives and other equipment are moving their loads over the country night and day. The construction of new engines and cars is being rushed forward in order that increasing traffic demands satisfactorily may be met, and so the work will go forward progressively so long as the war lasts.

"But what about after the war? At this moment it would be as futile to prophesy as to economic conditions of after-war years as it would be to say how long the struggle would last. We remember, with some apprehension, the boom times and later drastic depression which followed upon the year 1918, and there are those who foresee a somewhat similar, if less aggravated, experience ahead of us. If it does come it will partly be because we have failed to profit by lessons so vigorously administered to us in the past. There is every evidence, however, that government is giving this matter most serious consideration and that measures of control will be devised to mitigate such threatening eventualities. Manufacturers, business and financial men will do well to look back on the past and so govern their affairs to the same result.

"Certainly, one of the facts which already has been accentuated as a high light in the war is that the country's railways should always be maintained at a high point of efficiency if national crises are adequately to be dealt with. No other agency can then take their place to carry on their work uninterruptedly all through the year. If in more normal times they are starved and neglected so that their earnings are not adequate to provide high standards of service, it is the country's business which will suffer, while in times of emergency, their contribution to the national cause can be only partial and generally unsatisfactory."

A Survey of the C. N. R.'s Situation

"The upward trend of railway traffic which became manifest immediately upon the outbreak of war has continued and resulted in 1941 in a physical volume of traffic higher than any previously transported by the system," said President R. C. Vaughan of the C. N. R. in his year end statement. "Already in this war period demands made upon railway transportation in Canada have exceeded those of the last war by 60 per cent. The dominant role which railways play in the essential transportation needs of this country has been thoroughly established.

"To meet the increase of traffic handled by the National Railways, which since the outbreak of war has risen 95 per cent, has called for careful planning to make the best use of railway equipment and facilities. It has been necessary to improve and expand railway facilities in a number of districts. It has also been necessary to obtain additional equipment and this expansion has required special efforts on the part of all employees throughout the system.

"It has been the policy of the management in all cases to place the interests of the war effort first and to maintain the capacity of the railway to meet these essential demands. War transportation needs consist not only in the movement of hundreds of thousands of military personnel and of vast quantities of munitions and supplies, but also in the carriage of raw material and of semi-finished products which are moved in all parts of the country. This war traffic had of necessity to be added to the volume of normal business traffic. The measures which have been taken to enable the Canadian National to deal with this constantly increasing volume of traffic have been effective. Traffic offered has been moved to

destination expeditiously and the quality of service has been constantly maintained.

"The effect of the increased volume of traffic is reflected in the financial results of the system. While the audited revenue and operating expense figures for the month of December are not yet available, estimated results for that month added to the known figures for the first eleven months of the year indicate that 1941 operating revenues will total $303,000,000. The net revenue for 1941, estimated at $66,000,000, after meeting all expenses including equipment depreciation will be the largest in the system's history. Taxes and fixed charges including interest amount to $62,000,000 for 1941—therefore, it is expected that operating revenues will yield a surplus over and above all operating expenses, taxes and interest. We are, however, facing in 1942 many millions of uncontrollable increased expenditure for wages and materials, and there has been no corresponding increase in the price of our services.

"The capital improvements made during the year nearly all arose from the necessity of improving facilities on various lines of the railway which have now become strategic routes for the handling of actual and prospective war traffic. This work consisted of improving yards, terminals, shops, enginehouses, the construction of additional passing tracks and sidings and the installation of signals. Orders had been placed for various types of equipment, including locomotives and freight cars, but conditions imposed by war priorities presented difficulties for the builders who thus were unable to complete these orders. However, during the year we received 10 locomotives and 1,136 cars. There are on order undelivered 70 locomotives and 3,339 cars.

"In addition to furnishing transportation service, the railway has assisted in Canada's war effort by making available to the government the services of special departments of the railway, and by furnishing trained personnel to special government branches. The management is proud to report that nearly 4,000 employees have been granted leave of absence to enlist for active service in the navy, the army and the air force.

Munitions Manufacture by Railways

"It is also a matter of pride to state that the Canadian National has directly participated in the mobilization of Canadian industry for war purposes. We have constructed, under a financial arrangement with the government, a building measuring 511 ft. by 516 ft. with an area of over 263,600 sq. ft. for the 'National Railways Munitions, Ltd.,' and this plant has been in operation for some time. At that plant and elsewhere in car and locomotive shops part of the company's working force, numbering more than a thousand men, has been actively engaged in the manufacture of several types of munitions, including gun carriages, naval guns and gun mountings. At its drydock and shipbuilding yard the company has been and is yet constructing mine sweepers and these same facilities are also being used in building large cargo vessels for 'Wartime Merchant Shipping, Ltd.'

"The steamship companies which form a part of the Canadian National organization have also played their part in the Battle of the Atlantic and elsewhere. An additional wartime responsibility gladly accepted by the company was the management of the Canadian Government Merchant Marine which had been re-established and is operating Danish, French, Finnish, German and Italian vessels seized by the Canadian government. Canadian National Steamships craft have been trading in distant waters as well as to ports closer to Canadian shores, so that in addition to our employees who have enlisted in the fighting forces, a large number of our men are actively engaged in war work."

At an Atlantic Port

Mexican Railways Under New Management

The Mexican Railways Are Noted for Their Fine Masonry

Year 1941 saw Workers' Administration replaced on National Railways and properties returned to government for operation

By our Mexican Correspondent

ANOTHER complete change in management, involving the return to the government of responsibility for the operation of the properties of the National Railways of Mexico, including the Inter-Oceanic and the Tehuantepec National Railways, was the outstanding event of the year for the Mexican railways. The Workers' Administration, which had operated these properties for more than two years, was replaced by the new management on January 7, 1941. This was the culmination of negotiations lasting several months, which were inaugurated after it was demonstrated that the workers were not capable of operating the properties either efficiently or safely. Not only had expenses gotten out of control to such an extent that the railways were drifting into financial chaos, but several serious accidents that were directly traceable to lack of discipline indicated that employee morale was declining equally rapidly.

The government suggested a reorganization as early as October, 1940. This involved the readjustment of salaries and personnel to the basis in effect when the workers took over the properties on May 1, 1938. It also involved the cancellation of the government tax of 5.64 per cent then in effect on railway gross earnings and the transfer of this sum to the purchase of equipment, and the appointment of advisory and technical committees to assist the workers' administration. This plan was rejected by the Union of Railroad Workers of Mexico, but the situation went from bad to worse and, in December, 1940, in the interests of the nation's welfare, the workers administration of the railways was abolished by a decree of Manuel Camacho, president of the republic.

The Presidential Decree

President Camacho stated that there could be no possible doubt that the railways were in need of reorganization, involving new investments, the renewal of track and rolling stock, a complete revision of tariffs, and other measures. He said further that such a reorganization could only be made by the government itself, which had the power to establish a freight and passenger policy in harmony with production, the requirements of the highway program, irrigation projects and other official activities.

The bill to cover the working out of this decree was passed by the House of Representatives and went into effect on January 7, 1941.

This bill provided for the appointment of a decentralized public organization, to be known as the Administration of the National Railways of Mexico and to have complete charge of the N. R. of M. and the National of Tehuantepec. General Enrique Estrada was appointed general manager and a new board was installed, consisting of Roberto Lopez as president, together with three government and three union representatives. Drastic changes were made in the personnel of the official staff.

These have been reported in the *Railway Age* as they occurred, and include the appointment of new men in practically all departments.

The new management immediately undertook a study of policies and re-organization possibilities. They restored disciplinary systems, modified the rules for payment of overtime and sick benefits, changed the rules covering the issuance of passes, and, in general, established a drastic control of expenses. The result was that while, in the first eight months of 1941, the gross operating revenues increased 3.28 per cent as compared with 1940, the expenses increased only 1.53 per cent.

Generally speaking, the relations between the present administration and the railway union have been satisfactory and no friction of any serious nature has developed. The new management has respected employee seniority and the relationship between the management and the employees as to discipline is rapidly returning to normal.

Reports on the Situation

General Estrada reported to the Mexican senate on March 21, 1941, that box car ownership had been reduced from 8,000 in 1913 to 5,000 in 1940; that 300 of the total ownership of 1,000 locomotives are over 30 years old, and that at least 100 of these should be scrapped; and that at least 3,000 new box cars, 50 new locomotives, 200 new tank cars and 80 new passenger and mail-express cars, to cost 85,000,000 pesos, were urgently needed. Also, he reported that 3,300 kilometers of rail should be relaid with heavier sections at once.

He added that, during the workers administration, an "unbalanced generosity" had existed in the recognition of labor demands and in granting privileges and concessions beyond the financial power of the railways. The railways must now be operated on a strictly commercial and sound economic basis, his report stated further, keeping the expenses well within the limit of 85 per cent of the earnings, and holding the payroll to not more than 48 per cent of the total expenses.

General Estrada also stressed the necessity of securing between 160 and 200 million pesos within the next five years to meet the requirements of accrued obligations and to provide for the replacement of materials and rolling stock and for deferred maintenances. In furtherance of this plan, a committee on the re-organization and financing of the National lines was appointed in August, 1941, headed by President Camacho, and composed of the secretary of the department of communications and public works, the secretary of finance of the Federal government, and the general secretary of the Union of Railroad Workers. Plans are under way to place the Mexican railways on a self-sustaining basis as soon as the necessary expenditures have been made. Plans are also under way for financing the rehabilitation of the National of Tehuantepec, an interoceanic line which extends from Coatzacoalcos, on the Gulf of Mexico to Salina Cruz on the Pacific ocean, a distance of 303 kilometers. This trans-isthmus line is being undertaken to prepare for possible heavy increases in traffic during an emergency.

On September 1, 1941, President Camacho issued a report to his Congress, which largely confirmed that of General Estrada, with the additional information that 1,000 box cars were being built in the United States; 250 locomotives were undergoing reconstruction in Mexican shops, and arrangements were nearing completion for the purchase of 50 new locomotives. He stated that, in view of the present responsible management of the railways, the government was willing to guarantee expenditures up to 200 million pesos on behalf of the railways.

Operating Results for Eight Months

The trend of gross operating revenues has been steadily upward through 1941 and the total amounted to $112,805,154 (Mexican) in the first eight months of 1941, as compared with $104,069,344 for the same period of 1940, an increase of 8.39 per cent. Freight earnings increased from $76,387,861 to $79,940,996, or 4.65 per cent. Passenger earnings decreased from $20,641,110 to $20,191,560. Express earnings increased from $9,044,484 to $9,144,840, and miscellaneous earnings increased from $3,144,514 to $3,527,758, or 12.19 per cent.

Operating expenses rose from $92,787,219 in the first eight months of 1940, to $94,204,129 in the same period of 1941, because of the heavier volume of traffic handled. Maintenance of way expenses were reduced from $15,509,163 to $15,004,215, or 3.26 per cent, which may be attributed to lack of materials. Maintenance of equipment expenses increased from $26,295,970 to $28,600,823, notwithstanding a scarcity of materials and this increase may be attributed to a rise in salaries, since a new wage agreement went into effect during the first part of 1941. Traffic expenses decreased from $1,273,742 to $1,112,026 and transportation expenses decreased from $39,448,897 to $39,179,736 in spite of the greater volume of traffic handled, gross ton-kilometers having increased from 12,239,585,000 to 12,452,731,000, or 1.74 per cent, and carloadings from 431,033 to 441,268. Express expenses decreased from $4,050,595 to $4,046,050,

Table 1.—Selected Operating Statistics
First 10 Months of 1941-1940

	1941	1940	Inc. or Dec.	% Change
Locomotive kilometers	36,514,495	36,497,752	−16,743	0.05
Freight train kilometers	14,770,631	14,818,763	−48,132	0.32
Passenger train kilometers	10,662,696	10,682,707	−20,011	0.19
Mixed and spec. klms.	3,423,065	3,450,514	−27,449	0.80
Non-revenue kilometers	71,708	78,387	−6,679	8.52
Total Train Kilometers	28,928,100	29,030,371	−102,271	0.35
Pass. car kilometers	82,928,269	83,483,518	−1,075,249	1.29
Freight loaded kilometers	208,862,109	203,621,849	+5,240,260	2.57
Freight empty kilometers	97,324,101	98,082,511	−758,410	0.77
Freight Total Kilometers	306,186,210	301,704,360	+4,481,850	1.49
Net-ton kilometers (1,000s)	5,283,037	5,203,612	+79,425	1.53
Gross ton kilometers (1,000s)	12,452,731	12,239,585	+213,146	1.74
Total No. Cars Loaded	441,269	431,033	+10,235	2.37
Averages				
Net tons per train-klm.	341	335	+6	1.79
Gross tons per train-klm.	764	748	+16	2.14
Train speed-klms	22.6	22.6	...	...
Gross ton-klms, per train-hour	17,247	16,889	+358	2.12
Utilization of track power	74.0%	73.3%	+0.7	0.95
Frgt. locom. klms. (daily)	194	188	+6	3.19
Liters oil per 1,000 G. T. K. (Freight)	46.2	47.0	−0.8	1.70
% loaded car klms. to total	68.2	67.5	−0.7	1.04
Car-klms. per car (daily)	54.7	55.1	−0.4	0.73
Net tons per car	25.29	25.56	−0.27	1.06
Cars on line daily	16,624	16,006	+618	3.86
Klms. line operated	13,281	13,281	...	...

Table 2.—Freight Transported by Group Classification
First Six Months

	Tons		Revenues	
	1941	1940	1941	1940
Forest products	318,145	301,997	$ 3,660,451	3,352,286
Agricultural prods.	1,483,268	1,350,854	17,637,834	16,055,389
Animals & animal prods.	140,129	118,734	2,212,628	1,847,151
Inorganic prods.	2,252,599	2,248,810	20,120,644	19,835,818
General mdse.	466,337	412,766	8,885,962	8,004,064
Grand Total	4,660,478	4,433,161	$52,517,518	48,994,707
Per cent Inc.	5.13		7.37	

and general expenses increased from $6,214,432 to $6,-242,205.

The operating ratio decreased from 84.96 in 1940, to 83.51 per cent in 1941. As a result, net railway operating income increased from $16,430,750 in 1940, to $18,-601,024 in 1941. Including other income expenses incidental thereto, the operating ratio for all activities of the National Railways was reduced from 87.70 per cent in the first eight months of 1940 to 86.05 per cent in the corresponding period in 1941, which latter figure still exceeded by 1.05 per cent the ratio of 85 per cent stipulated in the law which created the new administration.

Labor and Material Costs

Higher prices of materials and higher salaries caused an increase in the costs of repairs to coaches, cars and locomotives as follows: For 12 months ending October 1941, labor charges for repairs to coaches increased from $23.51 to $25.58, or 8.8 per cent per 1,000 kilometers run, while the cost of materials decreased from $16.75 to $15.67, or 6.4 per cent giving a total combined increase from $40.26 to $41.25, or 2.5 per cent. Labor costs for the repair of freight cars increased from $16.80 to $20.83, or 24 per cent, and costs of materials increased from $18.08 to $22.91, or 26.7 per cent, while the total increased from $34.88 to $43.74 per 1,000 kilometers run. Labor charges for backshop locomotive repairs increased from $200.05 to $221.51 (10.7 per cent); the cost of materials rose from $130.65 to $149.45 (14.4 per cent); and the total costs increased from $330.70 to $370.96, or 12.2 per cent per 1,000 kilometers run. Likewise, the cost of labor for running locomotive repairs increased from $160.82 to $173.78, or 8.1 per cent, and the cost of material for these repairs increased from $42.52 to $42.62, or 0.2 per cent, bringing the total cost of these repairs up from $203.34 to $216.40, or 6.4 per cent.

Table 3.—Loaded Cars Interchanged
10 Months 1941-1940

	Imports		Exports	
	1941	1940	1941	1940
Laredo	10,060	5,882	6,905	5,927
El Paso	2,416	2,269	6,792	5,319
Eagle Pass	1,461	1,236	1,606	647
Brownsville	423	190	299	1,533
Totals	14,360	9,577	15,602	13,426
	Water Ports			
Tampico	1,846	1,998	4,151	3,556
Veracruz	2,175	1,283	3,231	3,688
Manzanillo	1,794	1,623	....	....
Totals	5,815	4,904	7,382	7,244

Operating Statistics

Table 1 gives a selection of comparative operating statistics of the National of Mexico for the first 10 months of 1941. Table 2 shows the freight handled by commodity classifications for the first six months of 1941, while Table 3 shows the number of cars of traffic moving in export and import.

It will be noted that the number of ton-kilometers per train increased 358. This was a result of the increase from 748 to 764 gross tons per train-kilometer, the average train speed having remained the same. The increase from 335 to 341 net tons per train-kilometer is also indicative of the heavier tonnage handled by the trains. Although kilometers per car per day decreased from 55.1 to 54.7, the percentage of loaded cars to the total increased from 67.5 to 68.2. The only adverse factor indicated is the decrease from 25.56 to 25.29 in the net tons per car.

The number of revenue tons handled increased from 3,433,161 during the first six months of 1940 to 4,660,-478 in the same period of 1941 (excluding government shipments and materials for other railroads), an increase of 1,227,317; and revenue net ton-kilometers increased from 2,205,611,524 to 2,251,138,383, handled in 217,351 loaded cars, which reflects an increase of 7,001 carloads (3.3 per cent). This resulted in an increase from $48,994,707 to $52,517,518 in carload freight revenue. The average earnings per ton-kilometer increased from 2.214 centavos to 2.333, as a consequence of a greater proportion of higher classification freight handled.

Additions and Betterments

During the first seven months of 1941 only $2,301,578 was invested in additions and betterments, of which $1,502,245 were spent on roadway and the balance on bridges, water stations and buildings. The heavy indebtedness and the yearly loss of about eight million pesos in the operation of the Interoceanic Railway did not permit a heavier investment in this item.

However, negotiations are well under way to obtain a loan and a credit of some 200 million pesos for rail, locomotive, car and coach purchases, which will place the national lines in first class condition to handle current and emergency movements. The investments above mentioned do not include six second hand locomotives bought for about a million pesos, and the 1,000 new cars ordered from an American firm. The National lines anticipate buying 26 new standard gage and 14 narrow gage locomotives; 16 first class and 64 second class coaches; 25 standard gage combination mail-express coaches; 200 stock cars, 100 gondola cars and 150 stock cars.

A study is now also under way to determine the practicability of converting the narrow gage road from Mexico City to Acambaro, via Toluca, to standard gage in order to provide another standard gage outlet to the border ports of El Paso and Laredo. In accordance with the law, which created the new administration of the National Railways of Mexico, the latter cannot undertake construction projects, but may operate the lines constructed by the department of communications and public works of the federal government.

During the first three months of 1940, the National Railways of Mexico employed an average of 43,929 workers, with total compensation of $8,734,258 per month, including ordinary and over time, vacation and sick pay, commissions, etc., an average of $198.83 per employee per month; while the same period of 1941 recorded an average of 44,840 employees per month, with total compensation of $8,828,987, and an average of $196.90 per month per employee.

Imports through international gateways with the United States show an increase of 4,783 cars in the first 10 months of 1941, as compared with the same period of 1940, notwithstanding the prevailing high rate of exchange, while exports increased only 2,176 cars, even though the rate of exchange should strongly favor exports. Water imports increased 911 cars, while exports increased 138 cars, as may be seen in the accompanying table.

In general, the results prove the wisdom of the step taken by President Camacho this year, for the new management has already inaugurated reforms which were reflected to a degree in the results in 1941, and which should become much more evident in 1942.

Investors' Interest Still Lacking

Stock prices at 1932 lows despite better earnings
Equipment trusts active—Reorganizations hit a snag

By Railway Age's Financial Staff

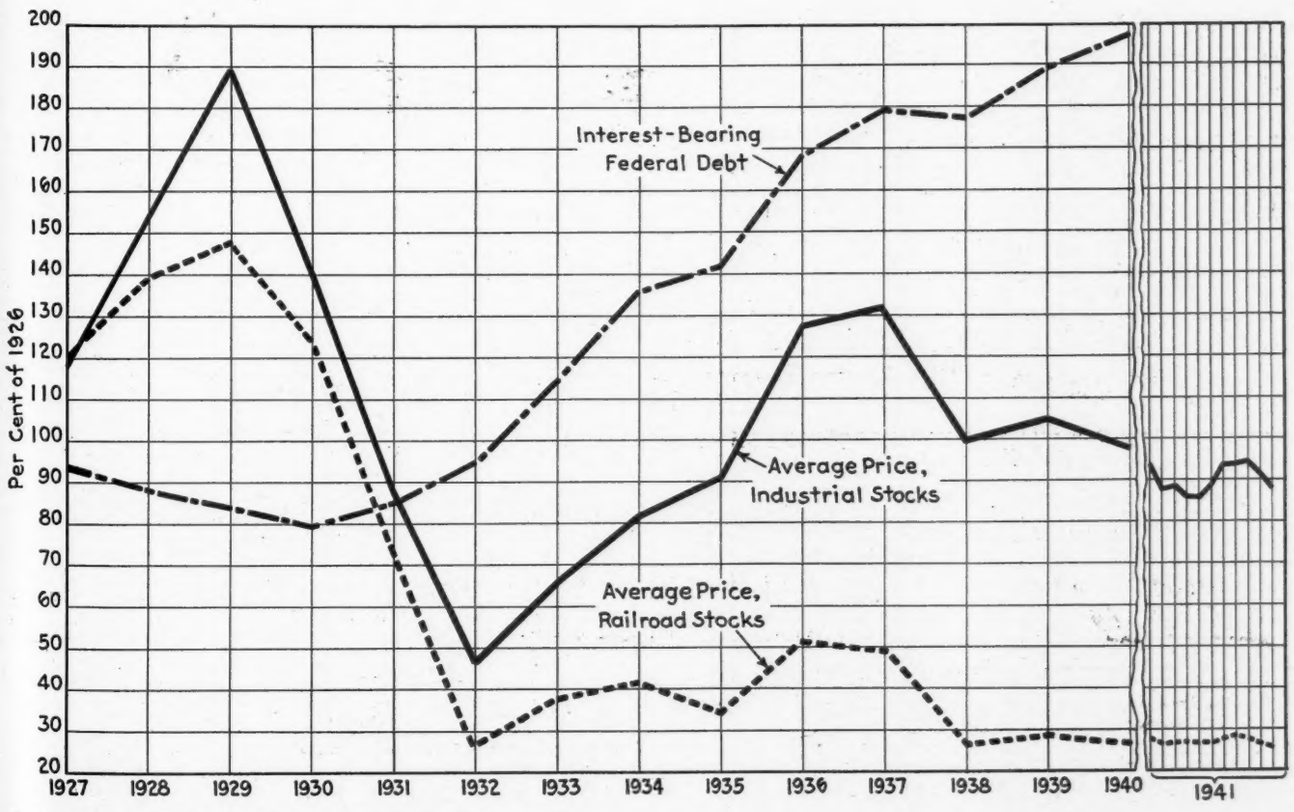
THE railroads in 1941 had their best year since 1929, as gaged by net railway operating income, and the best since 1930, measured by net income. Net railway operating income (i.e., the income left after paying operating expenses and taxes, but before deducting interest on indebtedness and before adding inter-company dividend and interest receipts) is estimated for the entire year by Dr. J. H. Parmelee of the Bureau of Railway Economics, elsewhere in these pages, at 980 million dollars. His estimate of net income (i.e., the amount left for the equity-holders after the payment of all charges) is 485 millions. In 1930 net railway operating income was 869 millions and net income was 524 millions. In 1929, the two totals were, respectively, 1,252 millions and 897 millions. The principal reason the roads earned more net income in 1930 than in 1941, with less net railway operating income, was that "other income" (that is, income from inter-company dividends and interest payments) was so much less this year than it was in the earlier period.

That the current income flush on the cheek of the railroads is febrile, rather than the bloom of financial health, is clearly evidenced in the average prices of stocks. Back in 1930, when the trend of traffic was still rapidly downward (instead of upward, as it now is) and when the railroads earned only 8 per cent more net income than they did in 1941, the average price of railroad stocks (Standard & Poor's index, as reported by the National Industrial Conference Board) was almost 126 per cent of the 1926 average. In 1941, the same index, for the first 11 months, will probably average not more than 27 per cent of the 1926 average. This decline does not take our actual involvement in the war into account.

The War Cannot Be Blamed

Since active hostilities began, the stock market prices of railroad securities have declined still further—but the major part of the decrease which has occurred since 1930 cannot be ascribed to the war, or the fear of war. Most of it came before misgivings arose as to the national safety.

An accompanying chart traces the course of the prices of industrial and railroad stocks since 1926, in percentages of the prices at which they sold in that year. It will be seen that, while the recovery in industrial



Source: National Industrial Conference Board, Computations by Railway Age

Confidence in Private Investment Sinks as (Pre-War) Federal Spending Dominates the Economic Picture

stocks since the bottom of the depression in 1932 has been meager, railroad stocks have been hovering around the 1932 levels since 1938.

The most obvious depressant operating against the prices of corporate stocks is, quite likely, the ascendancy of government spending over private investment. Such spending piles up obligations which are a charge against the future earnings of tax-paying (that is, non-government) investments; and the higher such obligations mount, the more discouraging does the outlook become for private investors. This factor works against the prices of railroad securities more strongly than it does against the industrials, because much government spending (e.g., highways and waterways) to a large degree *competes directly* against the railroads. Against all industry these expenditures threaten prolonged heavy taxation. Against the railroads they threaten both excessive taxation *plus* "loaded dice" competition. This, perhaps, explains why government spending—while it affects all private enterprise adversely, is especially damaging to the investment standing of the railroads.

These observations, of course, have nothing to do with necessary expenditures for the military defense of the country. Such expenditures, regardless of their cost, are just as much in the interest of private enterprise as they are of any other economic group in the country. It is well to note, however, that *non-defense expenditures* of the federal government rose from 3142 millions in 1933 to 7886 millions in 1940. And that governmental departments are busy drafting gigantic plans for public works, upon which they propose to engage the country the moment hostilities cease.

Quite aside from the war, then, it is clear that the political atmosphere in 1941 was not favorable to the revival of railroad credit. There was no new stock financing, and very little refunding of bond obligations except by heavily-guaranteed terminal lines and two or three of the "blue chips."

Equipment Issues

Equipment trust issues sold in 1941 involved more money than those sold in any year since 1923, a banner year of railroad buying in days that were prosperous for the railroads beyond comparison with this or the last decade. The total face amount of the 1941 issues was $268,546,000, as compared with $172,000,000 in 1940 and $93,000,000 in 1939. The principal amount of all

Principal Equipment Trust Issues Sold in 1941

Road	Maturity	Amount	Int. Rate %	Sold to Banker: Price	Sold to Banker: Cost	No. Bids Submitted	Purchaser
Atchison, Topeka & Santa Fe, Ser. E....	1942-51	$20,000,000	1⅝	100.434	1.55	4	Salomon Bros. & Hutzler, et al.
Atlantic Coast Line, Ser. H.....	1942-51	7,880,000	2⅛	100.399	2.04	3	Salomon Bros. & Hutzler, et al.
Baltimore & Ohio, Ser. L.	1942-51	5,880,000	1⅞	100.257	1.83	5	Drexel & Co., et al.
Chesapeake & Ohio	1942-51	5,100,000	1⅝	100.099	1.606	4	Salomon Bros. & Hutzler, et al.
Chesapeake & Ohio	1942-51	3,100,000	1⅝	100.111	1.605	6	Halsey, Stuart & Co., et al.
Chesapeake & Ohio	1942-51	4,300,000	1⅝	100.333	1.56	5	Harris, Hall & Co., et al.
Chicago & North Western	1942-51	5,400,000	1⅞	100.239	1.83	6	L. M. Marks & Co., et al.
Chicago & North Western	1942-51	2,325,000	2	100.261	1.95	7	Harris, Hall & Co., et al.
Chicago & North Western	1942-51	3,800,000	2⅜	100.31	2.35	4	Harris, Hall & Co., et al.
Chicago, Aurora & Elgin[1]	.....[2]	310,000	4	.....	...	..	.....
Chicago, Burlington & Quincy	1942-48	9,387,000	1½	100.679	1.33	5	Salomon Bros. & Hutzler, et al.
Chicago, Milwaukee, St. Paul & Pacific, Ser. V.	1941-51	3,120,000	2⅛	100.053	2.10	3	Drexel & Co., et al.
Chicago, Milwaukee, St. Paul & Pacific, Ser. W.	1942-48	2,744,000	1⅜	100.173	1.33	5	Harris, Hall & Co., et al.
Chicago, St. Paul, Minneapolis & Omaha[3]	1942-56	1,680,000	2½	Par	Par	..	Reconstruction Finance Corp.
Chicago, St. Paul, Minneapolis & Omaha.	1942-51	1,210,000	2⅜	100.019	2.37	3	Halsey, Stuart & Co.
Clinchfield, Ser. B[4]	1942-51	1,720,000	1¾	100.1259	1.72	7	Halsey, Stuart & Co., et al.
Denver & Rio Grande Western, Ser. G...	1942-51	1,260,000	2	100.597	1.88	2	Blyth & Co.
Denver & Rio Grande Western, Ser. I...	1942-51	1,260,000	2	99.234	2.15	2	Halsey, Stuart & Co.
Detroit, Toledo & Ironton	1942-51	1,150,000	1¼	98.323	1.57	7	Evans, Stillman & Co.
Elgin, Joliet & Eastern	1942-51	2,900,000	1	98.795	1.23	8	Drexel & Co.
Erie	1942-51	4,000,000	1⅞	100.064	1.862	7	Lazard Freres & Co., et al.
Florida East Coast, Ser. J.	1942-51	1,000,000	2¾	Par	Par	..	Reconstruction Finance Corp.
Grand Trunk Western	1941-51	5,692,000	2½	Par	Par	..	Reconstruction Finance Corp.
Gulf, Mobile & Ohio	1942-56	2,175,000	2.4	100.046	2.39	3	Harris, Hall & Co., et al.
Illinois Central, Ser. V.	1941-51	6,920,000	2	98.758	2.26	2	Halsey, Stuart & Co., et al.
Illinois Terminal, Ser. A.	1942-51	560,000	2	100.029	1.99	..	Harris, Hall & Co.
Louisville & Nashville, Ser. J.	1942-51	4,970,000	1⅝	100.077	1.61	6	Central Hanover Bank & Trust Co.
Missouri Pacific, Ser. EE.....	1942-56	2,895,000	2¼	101.069	2.10	8	Salomon Bros. & Hutzler, et al.
Missouri Pacific, Ser. FF.....	1942-51	1,150,000	2	100.912	1.81	6	Harris, Hall & Co., et al.
Missouri Pacific, Ser. GG.....	1942-56	4,185,000	2¼	101.666	2.03	6	Gregory & Son
Montour[5]	1942-46	500,000	1.04	Par	Par	11	Evans, Stillman & Co.
Nashville, Chattanooga & St. Louis, Ser. D.	1942-51	4,290,000	2⅛	100.17	2.09	4	Equitable Securities Corp.
New York Central	1942-51	10,900,000	1⅞	100.054	1.86	3	Salomon Bros. & Hutzler, et al.
New York Central	1942-51	15,000,000	2¼	100.539	2.14	2	Salomon Bros. & Hutzler, et al.
New York, Chicago & St. Louis.....	1942-51	1,250,000	1¾	100.047	1.745	3	Halsey, Stuart & Co., et al.
New York, Chicago & St. Louis.....	1942-51	5,800,000	2⅛	100.389	2.05	2	Salomon Bros. & Hutzler, et al.
New York, New Haven & Hartford.....	1942-51	2,890,000	1¾	99.361	1.88	11	Gregory & Son
New York, Ontario & Western	1942-51	162,000	2¾	Par	Par	..	Reconstruction Finance Corp.
Norfolk Southern	1941-56	938,000	3	Par	Par	..	Reconstruction Finance Corp.
Northern Pacific	1942-51	3,000,000	1¾	101.161	1.54	6	Equitable Life Assurance Society
Northern Pacific, Ser. B.....	1942-51	5,700,000	2	99.274	2.14	3	L. M. Marks & Co.
Pennsylvania, Ser. L.....	1942-56	11,925,000	1¾	100.043	1.74	5	First Boston Corp., et al.
Pennsylvania, Ser. M.	1943-57	18,465,000	2⅜	100.18	2.35	3	Salomon Bros. & Hutzler, et al.
Pere Marquette	1942-56	2,775,000	2⅛	100.233	2.09	4	Lazard Freres & Co., et al.
Seaboard Air Line, Ser. JJ.....	1942-56	1,905,000	3	Par	Par	..	Reconstruction Finance Corp.
Seaboard Air Line, Ser. KK[6]	1942-53	2,448,000	2½	Par	Par	..	Reconstruction Finance Corp.
Southern, Ser. JJ	1942-51	11,250,000	2	100.178	1.96	3	Harriman Ripley & Co., et al.
Southern Pacific, Ser. R.	1942-56	14,625,000	2¼	99.568	2.31	4	First Boston Corp., et al.
Southern Pacific, Ser. S.....	1943-52	4,430,000	2½	Par	Par	3	First Boston Corp.
Union Pacific Ser. F.	1942-56	12,570,000	1½	98.052	1.77	4	Salomon Bros. & Hutzler, et al.
Union Pacific, Ser. G.	1942-51	13,250,000	1½	99.94	1.51	4	First Boston Corp., et al.
Western Maryland, Ser. I.....	1942-51	1,900,000	2⅛	100.38	2.05	4	Salomon Bros. & Hutzler, et al.
Western Pacific[7]	1942-51	2,650,000	1¾	98.839	1.97	6	Harriman Ripley & Co., et al.
Wheeling & Lake Erie, Ser. H.....	1942-51	800,000	1½	100.112	1.48	14	Harriman Ripley & Co.
Wheeling & Lake Erie, Ser. I.....	1943-52	1,050,000	[8]	99.30	1.859	9	Salomon Bros. & Hutzler, et al.

[1] Under lease agreement certificates are to be deposited in escrow; escrow agent to make monthly payments to car builders.
[2] Certificates mature in monthly installments of $6,500 for first 12 months and $8,000 for 29 succeeding months.
[3] Sold to R. F. C. after road rejected bids from private banking houses of 100.132 for 2⅞s and 100.079 for 3s as being too low.
[4] Issued jointly by the Atlantic Coast Line and Louisville & Nashville which together lease the Clinchfield.
[5] Equipment trust notes issued pursuant to an agreement between the carrier and the car builder.
[6] Originally authorized at $3,552,000 but reduced a/c inability to procure certain portions of the equipment.
[7] One higher bid was received but rejected as "not responsive to the invitation."
[8] Callable, at par and interest, as a whole or in part, on any dividend date on or after Jan. 1, 1944. Hence each maturity is listed separately.

equipment obligations sold in 1923 was $292,927,553. Since—while the statistical background is not complete—this appears to have been the largest year in equipment obligations on record (equipment buying by this means is a comparatively modern financing device and the government bonded itself during the first World War for equipment purchases), 1941 then becomes the second highest year in volume of financing through equipment trust certificates in the history of railroading.

The number of separate issues involved in 1941 was 55, compared with 39 the previous year. Analysis of the total shows that a number of issues were "repeats" by roads entering the market several times during the year. Some 11 roads sold two issues and three roads floated three issues during the year.

The cost of equipment trust issues to the carriers (interest rate plus or minus difference from par of price paid by banker) increased slightly in 1941 from the record low costs of 1940. The average interest cost of issues sold in 1941 (except to R.F.C.) was 1.86 per cent, as compared with 1.75 per cent in 1940. The lowest interest cost enjoyed by any road during the year was 1.23 per cent, as compared with 1.15 in 1940. The highest cost of any issue sold to private bankers or institutions in 1941 was 2.39 per cent, as compared with 2.74 in 1940. Incidentally, the *average* cost in 1923 was 5.11 per cent!

Interest costs rose abruptly in June, due principally to the inability of the market to absorb the frequent offerings of large principal amounts in equipment issues. To sell the unsold portions of issues already purchased from the railroads, the bankers had to boost the yields of the longer maturities. It necessarily followed that new issues, to compete with those already undistributed publicly, bore higher interest rates and to protect themselves the banking houses bid in lower prices on the new issues, thereby increasing net costs to the railroads. In fact, the temporary glut of the market brought with it a drastic reduction in the number of bids submitted for new issues, so that the carriers had, perforce, to accept a situation in which the forces on the demand side were not as strong as usual.

A slight increase toward the end of the year in the cost of short-term borrowing generally, due to higher commodity prices and the influence of higher yield bases on federal government bonds, also affected the cost of equipment financing. A strong road like the Pennsylvania, for example, had to pay 2.35 for an issue sold in December, as compared with only 1.74 for an issue sold during the previous January. Since the percentage of equity put down by the carrier was identical in both issues, the increased cost reflected the general trend and not a special influence. With interest costs upward, the coupon rates of 1941's certificates show no material change from the previous year, the lowest—as then—being 1 per cent. The highest rate obtaining on any issue sold publicly was 2½ per cent. The majority of the non-R. F. C. issues sold bore rates of between 2 and 2½ per cent.

The factor which has the greatest effects on interest

R. F. C. Loans to Railroads as of October 31, 1941

	Disbursed	Repaid
Aberdeen & Rockfish	$127,000	$127,000
Alabama, Tennessee & Northern	275,000	90,000
Alton	2,500,000	1,176,143
Ann Arbor (Rec'rs)	634,757	634,757
Ashley, Drew & Northern	400,000	400,000
Baltimore & Ohio	95,343,399	12,484,019
Birmingham & Southeastern	41,300	41,300
Boston & Maine	47,877,937	7,684,937
Buffalo, Union-Carolina	.....	.....
Carlton & Coast	535,800	141,697
Carolina, Clinchfield & Ohio Railway (A. C. L. & L. & N., Lessee)	14,150,000	14,150,000
Central of Georgia	3,124,319	220,691
Central of New Jersey	464,298	464,298
Charles City Western	140,000	140,000
Chicago & Eastern Illinois Ry.	5,916,500	155,632
Chicago & Eastern Illinois R. R.	4,933,000	251,000
Chicago & North Western	46,588,133	4,338,000
Chicago Great Western R. R.	1,289,000	1,289,000
Chicago Great Western (Trustees)	150,000	150,000
Chicago Great Western Ry.	6,396,870	55,341
Chi., Milw., St. Paul & Pac.	11,500,000	1,080,537
Chi., Milw., St. Paul & Pac. (Trustees)	8,762,000	8,762,000
Chi., St. P., Minn. & Omaha	.....	.....
Chi., North Shore & Milw.	1,150,000	.....
Chi., R. I. & Pac. (Trustees)	2,680,000	2,680,000
Chi., R. I. & Pac.	13,718,700	.....
Cincinnati Union Terminal	8,300,000	8,300,000
Colorado & Southern	30,055,222	1,623,127
Columbus & Greenville Railway Company	.....	.....
Copper Range	53,500	53,500
Delaware, Lackawanna & Western	5,100,000	2,465,000
Denver & Rio Grande Western	8,081,000	500,000
Denver & Rio Grande Western (Trustee)	1,800,000	1,800,000
Denver & Salt Lake Western	3,182,150	71,300
Erie	16,582,000	582,000
Erie (Trustees)	10,000,000	10,000,000
Eureka-Nevada	.....	.....
Florida East Coast (Rec'rs)	1,867,075	813,075
Fort Smith & Western (Rec'rs)	227,434	10,000
Fort Worth & Denver City	8,780,422	61,422
Fredericksburg & Northern	.....	.....
Gainesville Midland R. R.	78,000	32,000
Gainesville Midland Ry. (Rec'rs)	.....	.....
Galveston, Houston & Henderson	3,183,000	1,211,000
Galveston Terminal	546,000	.....
Georgia & Florida (Rec'rs)	354,721	.....
Grand Trunk Western	1,000,000	.....
Great Northern	26,000,000	26,000,000
Green County	13,915	13,915
Gulf, Mobile & Northern	520,000	520,000
Gulf, Mobile & Ohio and Gulf, Mobile & Northern	9,500,000	597,000
Illinois Central	56,073,000	1,678,340
Kansas City Southern	1,112,000	1,112,000
Lehigh Valley	9,278,000	9,278,000
Litchfield & Madison	800,000	800,000
Louisiana & Arkansas	2,500,000	565,000
Maine Central	2,550,000	2,550,000
Maryland & Pennsylvania	285,500	50,000
Meridian & Bigbee River (Trustee)	985,000	.....
Minn., St. Paul & S. Ste. Marie	6,843,082	6,843,082
Mississippi Export	100,000	100,000
Missouri-Kansas-Texas	5,124,000	2,309,760
Missouri Pacific	23,134,800	.....
Missouri Southern	99,200	99,200
Mobile & Ohio	785,000	785,000
Mobile & Ohio (Rec'r)	1,070,599	1,070,599
Murfreesboro-Nashville	25,000	.....
New York Central	36,499,000	36,499,000
New, Chicago & St Louis	18,200,000	18,200,000
New York, New Haven & Hartford	7,699,778	975,007
Norfolk Southern (Rec'rs)	1,681,000	109,000
Northern Pacific	5,000,000	5,000,000
Pennsylvania	28,900,000	28,900,000
Pere Marquette	3,000,000	3,000,000
Pioneer & Fayette	17,000	15,000
Pittsburgh & West Virginia	9,045,207	4,975,207
Puget Sound & Cascade	300,000	300,000
St. Louis-San Francisco	7,995,175	2,805,175
St. Louis Southwestern	18,672,250	18,672,250
Salt Lake & Utah (Rec'r)	200,000	200,000
Salt Lake & Utah	400,000	245,000
Sand Springs	162,600	162,600
Savannah & Atlanta	1,235,000	52,000
Seaboard Air Line (Rec'rs)	8,225,000	624,000
Southern Pacific	44,000,000	44,000,000
Southern	50,905,000	47,471,000
Sumpter Valley	100,000	100,000
Tennessee Central	5,332,700	193,700
Texas City Terminal	1,897,000	.....
Texas & Pacific	2,035,000	789,000
Texas, Oklahoma & Eastern	.....	.....
Texas & South-Eastern	30,000	30,000
Tuckerton	39,000	39,000
Utah Idaho Central	452,000	210,080
Wabash Railway (Rec'rs)	25,973,383	10,241,800
Western Pacific	4,366,000	1,403,000
Western Pacific (Trustees)	13,502,921	3,736,165
Wichita Falls & Southern	750,000	500,000
Wrightsville & Tennille	22,525	22,525
Totals	$811,325,175	$367,881,186

Railroads Taken From Receivership or Trusteeship During 1941

Name of Road	Mileage Operated
Erie	2,392
Nypano	....
St. Louis Southwestern:	
Stephenville North & South Texas	....
Santa Fe, San Juan & Northern	*
Seaboard Air Line:	
Chesterfield and Lancaster	33
Raleigh & Charleston	20
Spokane International	152
Coeur d'Alene & Pend d'Oreille	....
Tennessee & North Carolina	25
Wabash	2,409
Wichita Northwestern	*
Total	5,031

* Removed from receivership during 1940.

Railway Securities Sold by Public Offering in 1916 and 1920 to 1941

Year	Bonds	Notes	Stock	Total R. R. financing	Total all financing	Per Cent R. R. to total
1916	$229,000,000	$126,000,000	$16,000,000	$371,000,000	$1,864,000,000	19.9
1920	194,583,000	193,840,000	3,737,000	392,160,000	3,324,922,000	12.1
1921	455,125,000	202,928,300	27,222,500	685,275,800	2,780,874,000	24.6
1922	299,025,800	288,936,500	27,068,100	615,030,400	3,200,176,000	19.2
1923	165,956,000	354,720,500	59,140,850	579,817,350	3,602,704,000	16.0
1924	620,347,000	351,276,200	11,000,000	982,623,200	4,185,590,000	23.5
1925	374,020,500	151,753,740	30,934,430	556,708,670	5,234,992,000	10.6
1926	241,954,000	172,477,000	41,577,200	456,008,200	5,746,354,000	7.9
1927	686,939,500	89,184,600	210,596,900	986,721,000	7,830,641,000	12.6
1928	525,719,000	79,911,000	187,369,100	792,999,100	8,473,880,000	9.4
1929	418,984,000	180,322,000	275,269,240	874,575,240	11,007,170,000	7.9
1930	800,694,000	142,168,000	63,805,600	1,006,667,600	5,920,498,000	17.0
1931	453,824,000	105,209,000	.....	559,033,000	2,730,082,000	20.5
1932	11,827,000	13,125,000	.....	24,952,000	684,806,000	3.6
1933	12,000,000	.....	.....	12,000,000	335,812,000	3.6
1934	172,074,000	71,068,000	.....	243,142,000	618,627,000	39.3
1935	107,746,000	57,372,000	.....	165,118,000	2,190,093,550	7.6
1936	592,254,000	77,580,000	.....	669,834,000	4,061,901,025	16.5
1937	60,547,000	100,500,000	.....	161,047,000	1,589,043,484	10.1
1938	60,000,000	22,270,000	.....	82,270,000	1,635,196,000	5.0
1939	81,800,000	53,363,000	.....	135,163,000	2,099,036,000	6.4
1940	213,831,000	119,477,000	.....	333,308,000	2,770,894,000	12.0
1941*	97,415,000	227,538,000	.....	324,953,000	2,306,492,000	14.1

* 11 Months Total as Compiled by Dow Jones & Co.

rate and cost is the degree of initial equity which the road invests in the equipment designated as security for the certificates. Certificates sold to bankers or institutions during 1941 covered 85 per cent of the equipment against which they were issued, on the average. Fifty-two of the issues sold in 1941 covered the cost of equipment as follows:

P. C. of Cost	No. Issues
98	1
95	1
90	16
87	1
85	1
80	17
75	13
72	1
50	1

The equity factor of 50 per cent shown for one issue is one of the highest yet recorded and accounts in great measure for the fact that the issue was sold by the carrier —which is in trusteeship—on an interest cost basis of 1.33 per cent, the third lowest of the year.

Another factor affecting interest cost and coupon rate is that of maturity. Of the two standard maturity periods for serial certificates—10 years and 15 years—the former is by far the more popular, both with banking houses which buy the certificates originally and the ultimate public buyers; hence it usually obtains lower interest for the issuing road. Eleven of 1941's issues carry maturity installments running for more than 10 years and in every instance except one the interest costs are somewhat higher than average. How this factor operates is illustrated by two comparable Missouri Pacific issues. One with a 10-year maturity run cost the road 1.81 per cent, while the other with a 15-year run, cost 2.10—this in spite of the fact that the road had greater percentage of equity in the latter than in the former.

Seven of the year's issues were sold to the Reconstruction Finance Corporation on the interest and cost basis established for the past several years of 3 per cent when the road has no equity; 2¾ per cent for a 10 per cent down payment and 2½ per cent for a 20 per cent down payment.

An additional issue came close to being sold to the corporation. Until recent months, the R. F. C. has taken largely those issues in which the road had little or no equity, since the bankers offered more favorable prices for issues having a higher degree of initial equity. But recent higher interest costs brought the bankers' offerings to a basis less favorable than Jesse Jones's standing price basis of 2½ per cent for issues with an 80 per cent equity. When the Southern Pacific opened bids for its Series S issue on December 18, it found the highest bid of 99.28 for 2½s to be less favorable than the R. F. C. basis of par for 2½s. Hence the road delayed its award of the issue until a more favorable basis was offered. Ultimately the highest bidder offered par—identical with the R. F. C. price—plus a premium of $100. The Chicago, St. Paul, Minneapolis & Omaha *did* sell a $1,680,000 issue on a 2½ per cent basis to the R. F. C. after bankers bid less favorable prices. It is clear that unless

Mileage in the Hands of Receivers or Trustees

(Figures to 1940, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1940. Figures for 1941 Compiled by *Railway Age*.)

Year ended	Miles of road operated by receivers or trustees at close of year	Net change during year in miles of road operated	No. of roads in charge of receivers or trustees at close of year
June 30, 1894	40,819	.....	192
1895	37,856	−2,963	169
1896	30,475	−7,380	151
1897	18,862	−11,614	128
1898	12,745	−6,117	94
1899	9,853	−2,892	71
1900	4,178	−5,675	52
1901	2,497	−1,681	45
1902	1,475	−1,022	27
1903	1,185	−290	27
1904	1,323	+138	28
1905	796	−527	26
1906	3,971	+3,176	34
1907	3,926	−45	29
1908	9,529	+5,603	52
1909	10,530	+1,001	44
1910	5,257	−5,273	39
1911	4,593	−664	39
1912	9,786	+5,193	44
1913	16,286	+6,500	49
1914	18,608	+2,322	68
1915	30,223	+11,615	85
1916	37,353	+7,130	94
Dec. 31, 1916	34,804	−2,550*	80
1917	17,376	−17,428	82
1918	19,208	+1,832	74
1919	16,590	−2,618	65
1920	16,290	−300	61
1921	13,512	−2,778	68
1922	15,259	+1,747	64
1923	12,623	−2,636	64
1924	8,105	−4,518	61
1925	18,687	+10,582	53
1926	17,632	−1,055	45
1927	16,752	−880	40
1928	5,256	−11,496	33
1929	5,703	+447	29
1930	9,486	+3,783	30
1931	12,970	+3,484	45
1932	22,545	+9,575	55
1933	41,698	+19,153	78
1934	42,168	+470	80
1935	68,345	+26,177	87
1936	69,712	+1,367	91
1937	70,884	+1,172	109
1938	76,938	+6,054	109
1939	77,013	+75	108
1940	75,270	−1,743	103
1941	67,901	−7,369	94

* Represents decrease for six months.

Railroads in the Hands of Receivers or Trustees on December 31, 1941

Road	Mileage operated	Mileage owned	Date of receivership or trusteeship	Long term debt in hands of public	Capital stock in hands of public	Total securities in hands of public	Receiver's or trustee's certificates in hands of public	Principal amount of obligations in default as to principal and/or interest
Akron, Canton & Youngstown	171	19	Apr. 4, 1933	$3,550,000	$1,500,000	$5,565,621	$152,000	$3,550,000
Northern Ohio	....	152	Apr. 4, 1933	2,500,000	79,700	2,579,700	None	2,500,000
Alabama, Tennessee & Northern	218	215	Dec. 15, 1934	3,783,789	1,533,848	5,502,637	.....	3,783,789
Burlington, Muscatine & Northwestern	11	11	Nov. 15, 1937	None	None	5,500	None	None
California & Oregon Coast	15	15	Feb. 19, 1925	209,226	350,000	559,226	25,000	.....
Central of Georgia	1864	1405	Dec. 19, 1932(a)	53,722,000	None	57,490,520	2,346,794(b)	48,882,000
Central Railroad of New Jersey	661	380	Oct. 31, 1939	48,731,000	11,942,800	60,673,800	None	48,731,000
Chicago & North Western	8283	8048	June 28, 1935	321,106,000	180,835,300	549,341,353	None	305,820,000
Chicago, Attica & Southern	155	140	Aug. 5, 1931	441,200	2,294,452	2,752,152	None	441,200
Chicago, Indianapolis & Louisville	520	520	Dec. 30, 1933	26,176,000	1,818,000	31,621,054	None	26,071,000
Chicago, Milwaukee, St. Paul & Pacific	10,821	9840	June 29, 1935	449,927,552	224,396,131	677,823,683	21,817,000	262,291,559(c)
Chicago, Rock Island & Pacific	7956	5018	June 7, 1933	266,880,383	128,892,512	395,772,894	24,816,000	173,071,383
Chicago, Rock Island & Gulf	....	710	Oct. 31, 1933	None	None	None	None	None
Choctaw, Oklahoma & Gulf	....	811	Oct. 31, 1933	8,935,000	None	8,935,000	None	None
Peoria Terminal	32(d)	30(d)	Oct. 31, 1933	930,000	None	930,000	None	930,000
Rock Island, Arkansas & Louisiana	....	376	Aug. 31, 1933	11,453,600	None	11,453,600	None	11,453,600
Rock Island, Memphis Terminal	....	6(d)	Oct. 31, 1933	None	None	None	None	None
Rock Island, Omaha Terminal	....	3(d)	Oct. 31, 1933	None	None	None	None	None
Rock Island, Stuttgart & Southern	....	21	Oct. 31, 1933	None	None	None	None	None
St. Paul & Kansas City Short Line	....	417	Aug. 31, 1933	9,984,430	None	9,984,430	None	9,984,430
Chicago, Springfield & St. Louis	8	8	Jan. 24, 1930	500,000	205,060	705,060	None	500,000
Denver & Rio Grande Western	2566	2272	Nov. 1, 1935	125,428,000	13,754,400	142,932,629	5,000,000	120,216,000
Denver & Salt Lake Western	....	38	Nov. 1, 1935	None	None	3,110,850	None	None
Duluth, South Shore & Atlantic	550	447	Jan. 1, 1937	4,208,000	10,827,500	15,035,500	None	3,822,000
Mineral Range	26	26	June 1, 1937	317,071	705,800	1,022,871	None	317,071
Erie (Name inserted to show corporate relationship)								
New Jersey & New York	41	32	July 1, 1938	1,022,960	366,400	1,389,360	None	1,022,960
New York, Susquehanna & Western	117	117	June 1, 1937	12,985,863	None	12,985,863	None	12,985,863
Wilkes-Barre & Eastern	....(e)	....	Sept. 25, 1937	2,358,520	None	2,358,520	None	2,358,520
Northern Railroad of New Jersey	....	21	Jan. 26, 1939	861,000	1,000,000	1,861,000	None	861,000
Florida East Coast	685	679	Sept. 1, 1931(f)	57,992,000	37,500,000	95,492,000	None	45,000,000
Fonda, Johnstown & Gloversville	20	20	Apr. 20, 1933	6,143,000	3,000,000	9,143,000	None	6,143,000
Fort Smith, Subiaco & Rock Island	15	15	July 23, 1938	None	None	None	None	None
Georgia & Florida	408	363	Oct. 20, 1929	6,850,000	13,382,441	21,379,162	600,000	5,893,000
Georgia, Southwestern & Gulf	36	....	Jan. 2, 1933	76,800	14,700	91,500	None	76,800
Albany & Northern	....	35	Jan. 2, 1933	400,000	None	400,000	None	400,000
Louisiana Southern	15	15	Aug. 2, 1933	200,000	100,000	300,000	None	None
Meridian & Bigbee River	61	61	June 15, 1933	500,000	300,000	800,000	1,010,000	500,000
Minneapolis & St. Louis	1409	1314	July 27, 1923	45,016,711	25,792,600	70,809,311	None	43,366,051
Minneapolis, St. Paul & Sault Ste. Marie	3224	3162	Dec. 31, 1937	87,322,800	18,086,700	117,143,258	None	87,322,800
Missouri Pacific	7139	6265	Apr. 1, 1933	$387,486,910	$154,639,600	$573,240,737	$10,823,000	$384,656,000
Boonville, St. Louis & Southern	....	0.18	June 1, 1936	245,000	None	245,000	None	245,000
Cairo & Thebes	....	25	Dec. 1, 1937	1,699,000	None	1,699,000	None	1,699,000
Chester & Mount Vernon	....	64	Dec. 1, 1937	None	None	None	None	None
Fort Smith Suburban	....	7	Dec. 1, 1937	None	None	None	None	None
Marion & Eastern	....	7	Dec. 1, 1937	None	None	None	None	None
Missouri-Illinois	193	133	July 1, 1933	2,125,500	1,102,500	3,228,000	None	None
Missouri Pacific R. R. Corp. in Nebr.	....	349	Apr. 1, 1933	None	None	None	None	None
Natchez & Southern	7	7	Dec. 1, 1937	None	None	None	None	None
New Orleans, Texas & Mexico	191	173	July 1, 1933	42,970,000	859,800	43,829,800	None	42,970,000
Asherton & Gulf	32	32	Dec. 1, 1937	None	None	None	None	None
Asphalt Belt	18	18	Dec. 1, 1937	None	None	None	None	None
Beaumont, Sour Lake & Western	146	84	July 1, 1933	None	None	None	None	None
Houston North Shore	....	27	July 1, 1933	None	None	None	None	None
Houston & Brazos Valley	38	38	Dec. 1, 1937	None	None	None	None	None
International-Great Northern	1155	1101	Apr. 1, 1933	45,867,000	None	46,287,202	None	45,750,000
Austin Dam & Suburban	....	2(g)	Dec. 1, 1937	None	None	None	None	None
New Iberia & Northern	104	65	Dec. 1, 1937	None	None	None	None	None
Iberia, St. Mary & Eastern	....	40	Dec. 1, 1937	None	None	None	None	None
Orange & Northwestern	62	62	Dec. 1, 1937	None	None	None	None	None
Rio Grande City	21	18	Dec. 1, 1937	None	None	None	None	None
St. Louis, Brownsville & Mexico	602	556	July 1, 1933	62,000	None	62,000	None	None
San Antonio Southern	45	29	Dec. 1, 1937	None	None	None	None	None
San Antonio, Uvalde & Gulf	317	314	July 1, 1933	None	None	None	None	None
San Benito & Rio Grande Valley	131	131	Dec. 1, 1937	None	None	None	None	None
Sugar Land	53	31	Dec. 1, 1937	None	None	None	None	None
Nevada Copper Belt	29	41	Apr. 2, 1925	Reorganization expected to be completed by Dec. 31, 1941.				
New York, New Haven & Hartford	1853	1196	Oct. 23, 1935	249,472,510	206,155,300	479,517,199	None	226,948,510
Hartford & Connecticut Western	....	22	July 31, 1936	None	338,200	338,200	None	None
Old Colony	....	453	June 2, 1936	14,348,200	12,820,800	28,569,000	None	14,348,200
Boston & Providence	....	65	Aug. 5, 1938	2,170,000	3,996,000	6,166,000	None	2,170,000
Providence, Warren & Bristol	....	14	Feb. 13, 1937	None	44,900	44,900	None	None
New York, Ontario & Western	576	318	May 20, 1937	29,191,572	58,114,043	89,531,265	None	29,191,572
Norfolk Southern	733	687	July 28, 1932	Reorganization expected to be completed by Dec. 31, 1941.				
Pittsburg, Shawmut & Northern	190	156	Aug. 1, 1905	14,655,600	15,000,000	29,655,600	2,044,350	14,655,600
Rio Grande Southern	172	172	Dec. 16, 1929	2,728,000	930,300	3,658,300	None	2,728,000
Rutland	407	393	May 5, 1938	9,216,000	9,080,300	18,296,300	None	9,216,000
St. Louis-San Francisco	5043	4975	Nov. 1, 1932(h)	271,051,767	114,701,526	399,387,588	None	268,094,767
St. Louis Southwestern	1006	745	Dec. 12, 1935	25,491,500	4,733,500	53,891,043	None	15,380,500
St. Louis Southwestern of Texas	608	608	Dec. 12, 1935	None	None	None	None	None
Seaboard Air Line	4307	3331	Dec. 23, 1930	162,849,660	84,964,792	247,814,452	23,092,900	147,977,178
Georgia, Florida & Alabama	....	192	Nov. 7, 1931	1,750,000	1,500,000	3,250,000	None	1,750,000
Seaboard-All Florida	....	184	Feb. 2, 1931	12,824,738	None	12,824,738	None	12,824,738
East & West Coast	side track		Feb. 2, 1931	583,018	None	583,018	None	583,018
Florida Western & Northern	....	233	Feb. 2, 1931	13,578,744	None	13,578,744	None	13,578,744
South Dayton	....	1	Jan. 12, 1937	Data not available.				
Tallulah Falls	57	57	June 23, 1923	None	None	None	None	None
Virginia & Truckee	47	47	Apr. 27, 1938	None	5,000,000	5,000,000	None	None
Wabash			Sale of road at public auction on December 1 approved by Court on December 15.					
Ann Arbor	294	294	Dec. 4, 1931	7,000,000	40,800	7,040,800	None	None
Waco, Beaumont, Trinity & Sabine	41	41	Feb. 8, 1930	None	1,113,000	1,113,000	12,734	None
Western Pacific	1195	1138	Aug. 2, 1935	64,267,509	75,800,000	140,067,509	9,875,000	59,698,509
Wilmington, Brunswick & Southern	30	30	Mar. 17, 1933	93,750	165,000	258,750	None	93,750
Wisconsin Central	1117	984	Dec. 2, 1932	33,759,000	11,391,700	45,150,700	2,270,000	33,513,000
Yosemite Valley	78	78	Dec. 22, 1936	2,318,000	1,448,775	3,963,400	None	2,318,000
Yreka Western	8	8	Sept. 16, 1935	None	None	None	16,000	None

(a) Changed to trusteeship June 19, 1940.
(b) Includes $953,794 par value of equipment purchase agreements.
(c) Does not include 5% Convertible Adjustment Mortgage Bonds in the principal amount of $182,873,693, the interest on which is cumulative and matures with the principal on January 1, 2000 unless previously earned and declared payable.
(d) Yard tracks and sidings.
(e) Ceased operations March 26, 1939.
(f) Changed to trusteeship Feb. 1, 1941.
(g) Yard switching tracks.
(h) Changed to trusteeship May 16, 1933.

Note:—The effort has been made, in the above table, to list only those securities of bankrupt carriers which are actually in the hands of the investing public—and to exclude securities of one carrier held by an affiliated carrier. Where securities are held by other railways not affiliated with the issuing company, however, they are included in the above list as publicly held. Owing to the complexities of some corporate structures, the decision as to the fact of public or other-carrier ownership has perforce, in some instances, been arbitrary. The purpose has been to give a general picture of the public stake in bankrupt carriers rather than a comprehensive tabulation of legal obligations.

Summary of Railroad Receiverships and Trusteeships, 1876 to 1941

Year	Roads Placed in Receivership or Trusteeship: Number of roads	Miles	Bonds and stocks	Roads Taken from Receivership or Trusteeship *: Number of roads	Miles	Bonds and stocks
1876	42	6,662	$467,000,000	30	3,840	$217,848,000
1877	38	3,637	220,294,000	54	3,875	198,984,000
1878	27	2,320	92,385,000	48	3,906	311,631,000
1879	12	1,102	39,367,000	65	4,909	243,288,000
1880	13	885	140,265,000	31	3,775	263,882,000
1881	5	110	3,742,000	29	2,617	137,923,000
1882	12	912	39,074,000	16	867	65,426,000
1883	11	1,990	108,470,000	18	1,354	47,100,000
1884	37	11,038	714,755,000	15	710	23,504,000
1885	44	8,836	385,460,000	22	3,156	278,394,000
1886	13	1,799	70,346,000	45	7,687	374,109,000
1887	9	1,046	90,318,000	31	5,478	328,181,000
1888	22	3,270	186,814,000	19	1,596	64,555,000
1889	22	3,803	99,664,000	25	2,930	137,815,000
1890	26	2,963	105,007,000	29	3,825	182,495,000
1891	26	2,159	84,479,000	21	3,223	169,069,000
1892	36	10,508	357,692,000	28	1,922	95,898,000
1893	74	29,340	1,781,046,000	25	1,613	79,924,000
1894	38	7,025	395,791,000	42	5,643	318,999,000
1895	31	4,089	369,075,000	52	12,831	761,791,000
1896	34	5,441	275,597,000	58	13,770	1,150,377,000
1897	18	1,537	92,909,000	42	6,675	517,680,000
1898	18	2,069	138,701,000	47	6,054	252,910,000
1899	10	1,019	52,285,000	32	4,294	267,534,000
1900	16	1,165	78,234,000	24	3,477	190,374,000
1901	4	73	1,627,000	17	1,139	85,808,000
1902	5	278	5,835,000	20	693	39,788,000
1903	9	229	18,823,000	13	555	15,885,000
1904	8	744	36,069,000	13	524	28,266,000
1905	10	3,593	176,321,000	6	679	20,307,000
1906	6	204	55,042,000	8	262	10,400,000
1907	7	317	13,585,000	6	114	13,777,000
1908	24	8,009	596,359,000	3	138	2,547,000
1909	5	859	78,095,000	12	2,629	250,033,000
1910	7	735	51,427,500	17	1,100	93,660,109
1911	5	2,606	$210,606,882	13	1,386	$40,741,543
1912	13	3,784	182,112,497	12	661	25,910,990
1913	17	9,020	477,780,820	6	1,159	86,163,850
1914	22	4,222	199,571,446	9	1,470	83,189,500
1915	12	20,143	1,070,808,628	11	3,914	285,258,782
1916	9	4,439	208,159,689	26	8,355	703,444,855
1917	19	2,486	61.169.962	20	10,963	557,846,348
1918	8	3,519	242,090,800	11	763	24,735,187
1919	7	244	11,886,779	8	459	15,479,587
1920	10	541	21,620,150	7	380	7,676,200
1921	14	1,744	63,872,113	11	4,173	306,123,942
1922	12	4,330	329,114,860	15	6,151	299,491,646
1923	10	2,218	87,913,581	8	637	14,622,900
1924	11	920	30,223,372	14	3,992	269,251,082
1925	6	11,368	680,422,080	6	638	9,965,000
1926	6	88	2,821,400	12	12,852	626,662,708
1927	6	924	45,236,674	5	142	4,254,000
1928	1	19	529,000	4	209	6,393,250
1929	3	634	30,981,391	5	562	20,715,065
1930	4	4,752	277,323,994	2	1,048	124,668,500
1931	19	5,195	432,151,526	2	102	993,860
1932	13	11,817	626,577,314	8	394	8,575,178
1933	18	21,222	1,229,678,183	2	298	16,133,000
1934	1	81	460,000	2	40	1,598,600
1935	16	29,018	2,182,979,167	5	436	9,146,800
1936	4	8	43,026,400	3	122	7,507,961
1937	23	1,937	186,136,861	2	179	5,455,810
1938	9	6,194	660,997,669	8	290	.....
1939	3	733	78,858,800†	4	401	.....
1940	..	....	.....	6	3,675	.....
1941	1	25	.....	9	5,031	.....

* Prior to 1938 these figures covered foreclosure sales only.
† Represents long term debt and stock outstanding.

the R. F. C. modifies its standard offer, the government landing agency will operate as a club to keep the cost of equipment financing down to at least the level it has established. Whether the bankers will meet these prices to keep financing of the type out of government hands remains to be seen in the next few months.

The hand of priorities is reflected in the equipment trust field by the failure of carriers to secure deliveries of equipment. Since equipment is the security for the certificates, the parties to a trust agreement must reduce the amount of the issue to conform to actual deliveries. Thus the Seaboard Air Line reduced its Series KK issue to $2,448,000 from the authorized amount of $3,552,000 because it was unable to procure certain Diesel-electric locomotives.

One of 1941's issues was sold directly to a bank and another to an insurance company, the latter bid in direct competition with securities houses. Although institutional investors frequently absorb portions of equipment trust issues by re-sale, it is not usual for one to enter into the original bidding.

Dividend Changes Not Spectacular

Increases in dividends during the year were not many, nor spectacular. The Atlantic Coast Line resumed disbursement on its common stock, and the Pennsylvania and the Louisville & Nashville made larger payments than they did in 1940. Extra payments by the few railroads which occasionally make them were not much larger than those of 1940. Several smaller roads made up, slightly, their arrearages on cumulative preferred. A number of roads used their improved cash position to advantage, in the repayment of bank loans and of borrowings from the Reconstruction Finance Corporation. This last-named institution reported repayments by railroads of approximately $53,000,000 in the eleven months, November 30, 1940, to October 31, 1941. But, probably, the principal use for the increase in earnings will be disclosed as capital expenditures. These, according to Dr. Parmelee's estimate, will total 600 million dollars in 1941, an increase of about $170,000,000 over 1940. The railroads, in other words, are to a very large degree using their increased earnings—not for the primary advantage of their owners, but rather to provide new and improved facilities, to enable them to assure adequate service to the nation in its present crisis.

Why Reorganization Goes Slowly

Naturally, with the improvement in earnings, the general solvency of the railroad industry improved considerably in 1941. Only one small company entered bankruptcy during the year, and it also was reorganized during the year. On the other hand, several carriers, including two important ones, were reorganized during the year. The situation with respect to railroad insolvency is reflected in detail in accompanying tables. (It will, perhaps, be noted that the totals shown here do not correspond entirely with those given by Dr. Parmelee in his statistical review elsewhere in these pages—a difference which is largely accounted for, apparently, by the fact that it is our practice to record reorganization as of the time when it occurs *de facto*).

The process of revamping bankrupt companies has been slowed down by the policy of the Interstate Commerce Commission to "put them through the wringer," usually denying equity-holders a share in the reorganized company. This denial, coupled with recent largely-in-

(*Continued on page 128*)

$1,648,028,000 of Railway Buying in 1941

424-million dollars of equipment ordered from builders—Purchases 75 per cent over 1939—Millions in unfilled orders

By D. A. Steel

Purchases and Stores Editor

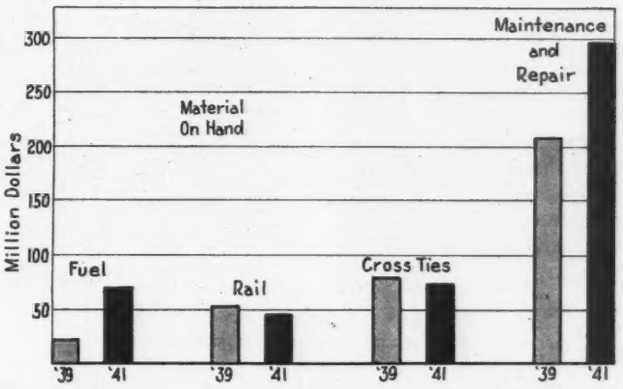
AS nearly as can be determined at this time, $1,-648,028,000 of purchases were made for railway operation in this country last year. This total includes $824,100,000 of materials, exclusive of equipment and fuel, received by the Class I railroads during the 12 calendar months; approximately $40,000,000 of material received by the short lines and $21,967,903 of material received by the Pullman Company and nine private car lines, together with $423,949,000 of new locomotives and cars ordered from equipment builders by railroads, industries and military branches of the Government for use in rail transportation in this country—a combined total of $1,310,017,000 of purchases from manufacturers. The grand total also includes $338,-011,000 of fuel received by Class I railroads.

Annual Purchases—Supplies and Equipment—12 Months

	Materials received from mfrs. (000)	Equipment ordered from mfrs. (000)	Total from mfrs. (000)	Fuel (000)	Total including fuel (000)
		CLASS I ROADS			
1929	$991,795	$397,121	$1,388,916	$336,805	$1,725,721
1930	727,223	146,471	873,694	308,277	1,181,971
1931	451,651	28,873	480,524	243,349	723,873
1932	268,100	2,623	270,723	177,000	447,723
1933	276,846	5,857	282,703	180,904	463,607
1934	395,012	66,850	461,862	209,488	671,350
1935	365,830	35,696	401,526	228,720	630,246
1936	555,841	222,594	778,435	266,463	1,044,898
1937	697,402	173,320	870,722	282,366	1,153,088
1938	343,033	74,006	417,039	239,778	656,817
1939	519,494	188,838	708,332	257,879	966,211
1940	582,296	251,127	833,423	273,677	1,107,100
1941*	824,100	423,949	1,248,049	338,011	1,586,060
	ALL RAILROADS AND CAR LINES				
1939	556,404	188,838	745,242	269,351	1,014,593
1940	636,128	233,744	869,872	272,973	1,142,845
1941*	886,068	423,949	1,310,017	338,011	1,648,028

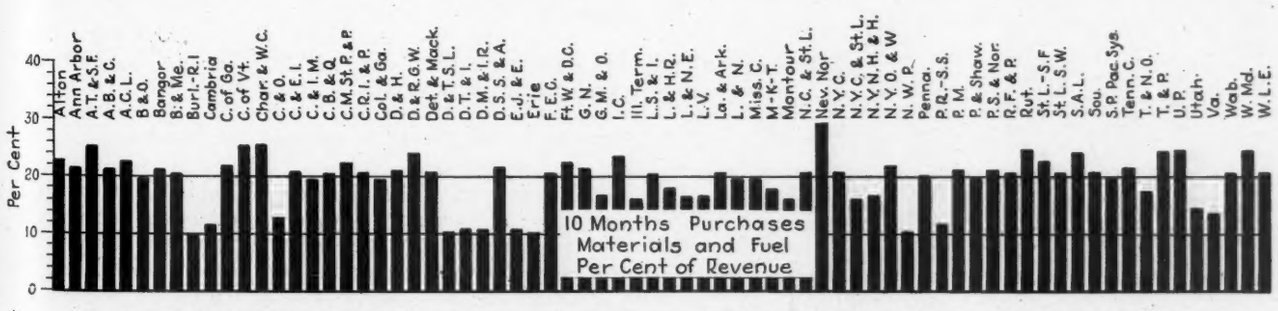
* Subject to revision.

These totals would be increased by including materials purchased by contractors for railway construction projects and expenditures by all the railroads for miscellaneous services. The equipment total is exclusive of orders for cars and locomotives to be built in railroad shops as the material for this equipment is reported under materials as and when received. Private car line purchases included in the total are those of the Armour Car Lines, the Burlington Refrigerator Express, the Fruit Growers Express, the Merchants Despatch, the Northern Refrigerator Line, the Pacific Fruit Express, the Western Fruit Express and the Wilson Car Lines for maintaining private line equipment,—a total of $9,-562,680, while the purchases of the Pullman Company totaled $12,405,223.

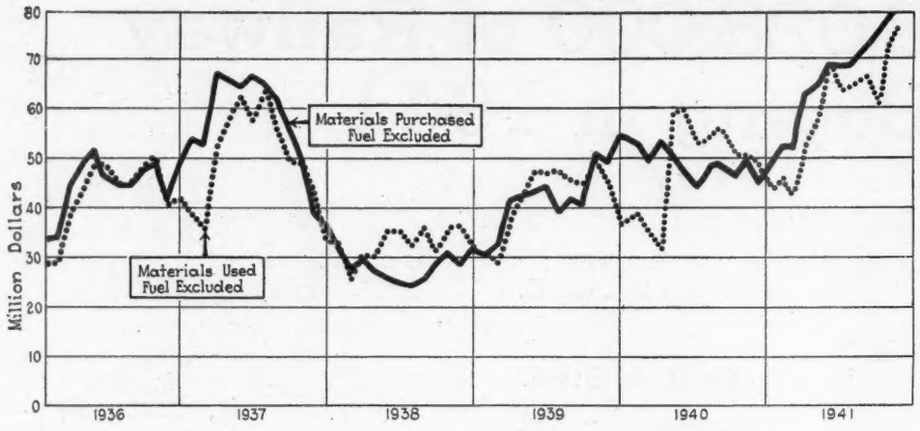


Dollar Volume of Material and Supplies in Stock on Class I Railways on August 1, 1939 and October 1, 1941

Although these summaries of purchases for rail transportation are necessarily preliminary at this time, they demonstrate graphically not only that railroads have shown initiative in preparing for war-time responsibility but also that they succeeded impressively in meeting



Material and Fuel Received by the Railroads, Compared with Their Operating Revenues in the Same Period



Month-to-Month Trends of Materials Delivered to the Railroads and Materials Consumed

their increased requirements for materials despite the increased difficulties of obtaining them.

$1,310,017,000 from Manufacturers

Materials received by all railroads from manufacturers, consisting chiefly of products of iron and steel and other materials for maintenance and repair, were larger than the corresponding purchases in 1940 by $249,940,000 or 39.0 per cent, were larger by $329,662,000 or 60 per cent than in 1939, and the Class I railroad total was within $167,695,000, or 17 per cent, of the corresponding purchases in 1929. Orders placed with commercial builders for new locomotives and cars exceeded those made in 1940 by $172,822,000, or 67 per cent, were larger than the corresponding purchases in 1939 by $234,111,000, or 124 per cent, and they exceeded in dollar volume the corresponding purchases made in 1929—a big equipment year— by $26,828,000, or 6.7 per cent.

The combined purchases of materials and equipment from manufacturers, as compiled by this paper for all the railroads, were $440,145,000, or 51 per cent, larger than in 1940, and exceeded the corresponding total in 1939 by $564,775,000, or 75 per cent; they were almost equal to the corresponding total for 1929.

Railway Purchases—Materials and Supplies

	Fuel (000)	Rail (000)	Cross ties (000)	Other Material (000)	Total (000)	Total Less Fuel (000)
			YEAR 1939			
Jan.	$23,377	$483	$2,445	$27,374	$53,679	$30,302
Feb.	23,063	2,934	2,632	26,721	55,350	32,287
Mar.	24,361	4,631	3,660	33,467	66,119	41,758
Apr.	17,833	5,370	3,297	33,842	60,342	42,509
May	16,925	6,569	3,697	35,651	62,842	45,917
June	17,783	5,893	3,742	33,956	61,374	43,591
July	19,502	2,293	3,157	33,749	58,701	39,199
Aug.	20,446	2,761	3,779	34,741	61,727	41,281
Sept.	21,292	2,000	3,357	35,410	62,059	40,767
Oct.	24,381	2,436	3,221	45,407	75,445	51,064
Nov.	24,254	1,778	2,967	44,918	73,917	49,663
Dec.	24,663	1,192	3,805	49,159	78,819	54,156
12 Mos.	$257,880	$38,340	$39,759	$434,395	$770,374	$512,494
			YEAR 1940			
Jan.	$24,978	$3,529	$4,128	$45,593	$78,228	$53,250
Feb.	24,219	4,814	3,928	39,939	72,900	48,681
Mar.	21,880	6,043	4,634	42,655	75,212	53,332
Apr.	21,575	6,470	4,585	39,407	72,037	50,462
May	21,851	5,019	4,789	37,122	68,781	46,930
June	20,160	5,022	4,645	34,510	64,337	44,177
July	20,875	4,571	4,294	39,446	69,186	48,311
Aug.	22,128	2,324	3,898	42,017	70,367	48,239
Sept.	21,575	1,856	3,382	40,776	67,589	46,014
Oct.	23,104	2,573	3,487	43,630	72,794	49,690
Nov.	24,145	2,094	3,116	39,620	68,975	44,830
Dec.	27,187	1,100	3,110	44,169	75,566	48,379
12 Mos.	$273,677	$45,415	$47,996	$488,884	$855,972	$582,295
			YEAR 1941			
Jan.	$26,319	$3,131	$3,669	$45,581	$78,700	$52,381
Feb.	26,937	4,788	3,714	43,586	79,025	52,088
Mar.	30,046	4,671	4,320	54,218	93,255	63,209
Apr.	18,540	4,391	4,613	55,595	83,139	64,599
May	24,667	5,601	4,617	59,654	94,539	69,872
June	26,394	4,400	4,303	59,844	94,941	68,547
July	28,674	4,246	4,431	61,283	98,634	69,960
Aug.	29,482	3,493	4,581	64,548	102,104	72,622
Sept.	30,482	4,981	4,597	65,921	105,981	75,499
Oct.	33,470	2,759	4,778	70,036	110,043	77,573
Nov.*	32,000	2,000	4,500	72,250	110,750	78,750
Dec.*	32,000	1,500	4,500	73,000	111,000	79,000
12 Mos.	$338,011	$45,961	$52,623	$725,516	$1,162,111	$825,100

* Subject to revision.
* Estimated.

Material Received Up 50 Per Cent

Total materials and supplies, and fuel, exclusive of equipment, received by all the railroads in 1941 were larger by $314,878,000, or 35 per cent, than in 1940 and exceeded the materials and fuel received in 1939 by $398,324,000 or almost 48 per cent.

Emphasis is placed on the volume of materials and supplies received by the railroads in this period. This is not only because orders for new cars and locomotives get relatively more attention but also for the reason that the war has shifted interest in railway buying from its power to stimulate business, as was the case during the depression, to the results of programs to meet present transportation requirements, and also because the present difficulty of getting materials, as explained elsewhere in this issue, sharpens the distinction between materials and equipment delivered and material and equipment on order. Materials and supplies, exclusive of fuel, received for maintenance and repair by the Class I railroads since this country's National Defense program was organized in August, 1939, have totaled $1,552,383,000.

Materials received last year included $45,961,000 of rail, as nearly as can be determined at this time, $52,623,000 of cross ties, and $725,516,000 of other materials for maintenance and repair,—about the same quantities of rails and ties that were received in 1940, but $7,621,000 more rail and $12,864,000 more cross ties than were received in 1939. The dollar volume of other maintenance and repair materials received by the Class I railroads last year exceeded the deliveries in 1940 by $235,622,000, or 48 per cent, and they exceeded the corresponding deliveries in 1939 by $291,121,000, or 67 per cent. The total of $77,573,000 of rail, ties and other maintenance and repair materials received by the railroads last October were 51 per cent larger than the corresponding deliveries in October, 1940, and 83 per cent over the corresponding deliveries in August, 1939. Thirteen railroads provided 272,000 cross ties

for military projects last year, the number provided by all the railroads being much larger.

Increases On All Roads

All but 6 of 78 railroads reporting for the entire 10 months of 1941 up to the time this article was written, received more materials than in the first 10 months of 1940, increases amounting to 29 per cent on the Atchison, Topeka & Santa Fe, 22 per cent on the Baltimore & Ohio, 43 per cent on the Boston & Maine, 23 per cent on the Chicago, Burlington & Quincy, 29 per cent on the Denver & Rio Grande Western, 45 per cent on the Elgin, Joliet & Eastern, 23 per cent on the Great Northern, 33 per cent on the Illinois Central, 66 per cent on the Missouri-Kansas-Texas, 30 per cent on the New York Central, 30 per cent on the New York, New Haven & Hartford, 32 per cent on the Northern Pacific, 75 per cent on the Pennsylvania, 36 per cent on the Southern, 51 per cent on the Union Pacific and 56 per cent on the Western Maryland.

Materials in Stock—Class I Railroads

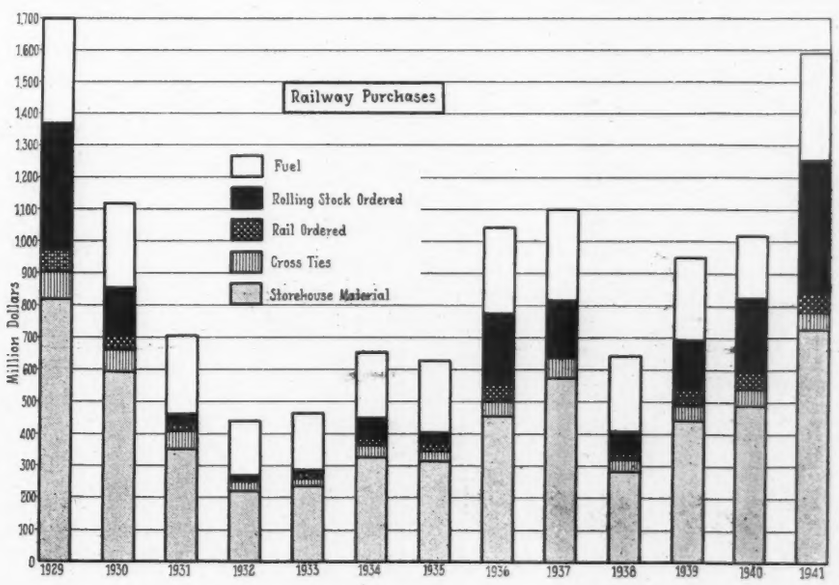
	Fuel (000)	Rail—New and S. H. (000)	Cross ties (000)	Stores Stock (000)	Scrap (000)	Total (000)
			YEAR 1939			
Jan. 1.....	$22,660	$24,733	$59,491	$199,477	$11,200	$317,561
Feb. 1.....	25,594	24,691	61,796	196,330	10,393	318,840
Mar. 1.....	27,100	26,229	63,346	196,669	10,239	323,583
Apr. 1.....	29,445	27,695	65,246	197,383	10,686	330,455
May 1.....	24,101	28,459	60,749	203,806	11,217	328,332
June 1.....	21,048	29,345	57,067	205,169	11,548	324,177
July 1.....	18,732	30,520	52,809	205,027	11,761	318,849
Aug. 1.....	20,175	30,026	52,158	197,960	12,023	312,342
Sept. 1.....	21,165	29,137	51,375	194,802	12,384	308,863
Oct. 1.....	21,512	28,274	49,592	193,025	12,235	304,638
Nov. 1.....	20,800	26,642	47,330	197,378	11,722	303,872
Dec. 1.....	23,866	25,972	51,309	198,564	11,021	310,732
			YEAR 1940			
Jan. 1.....	21,778	25,552	51,359	216,996	11,551	327,236
Feb. 1.....	22,454	28,213	58,187	222,127	11,862	342,843
Mar. 1.....	23,190	31,546	60,615	230,045	11,576	356,972
Apr. 1.....	21,016	34,388	64,466	234,899	11,509	366,278
May 1.....	21,343	35,826	63,945	234,866	11,551	367,531
June 1.....	22,419	34,818	60,070	231,308	11,275	359,890
July 1.....	22,310	35,138	57,452	225,066	11,371	351,337
Aug. 1.....	24,065	34,134	55,988	222,001	11,326	347,514
Sept. 1.....	25,513	31,927	54,531	217,948	11,041	340,960
Oct. 1.....	25,442	30,055	53,517	216,201	10,848	336,063
Nov. 1.....	22,272	27,457	50,374	221,444	9,711	331,258
Dec. 1.....	24,414	27,674	54,464	213,555	9,602	329,709
			YEAR 1941			
Jan. 1.....	24,002	25,985	50,967	223,673	9,818	334,445
Feb. 1.....	24,591	26,600	60,311	220,887	10,728	343,117
Mar. 1.....	27,105	28,217	62,455	228,012	10,859	356,648
Apr. 1.....	30,984	28,573	65,356	235,404	11,102	371,419
May 1.....	23,486	25,649	58,349	251,691	9,632	368,807
June 1.....	24,578	26,461	57,051	252,972	10,357	371,419
July 1.....	25,991	24,389	51,551	266,019	9,669	377,619
Aug. 1.....	29,299	25,156	55,976	265,886	10,264	386,581
Sept. 1.....	32,632	24,500	51,745	276,661	10,380	395,918
Oct. 1*.....	34,035	25,755	44,327	298,149	9,704	411,970
Nov. 1*.....	40,719	24,507	49,911	297,006	10,303	422,446

* Subject to revision.

Over the Hudson River at Albany, N. Y.

Inventories Up

Reports available at this time indicate an aggregate inventory of materials and supplies in the hands of Class I railroads on November 1 of $422,446,000, which is



Railway Materials Delivered and Equipment Ordered from Builders, 1929 to 1941—Excludes Unfilled Orders for Material

$91,188,000 larger than the total on November 1, 1940, and an increase of $110,104,000, or 32.4 per cent, over the total for August, 1939. Railway inventories consist of working stocks, much standby materials to protect train operation and about $10,000,000 of scrap. New and second-hand rail on hand on November 1 totaled $24,507,000, as compared with $30,026,000 in August, 1939. The cross tie total was $49,911,000, compared with $52,158,000 in August, 1939, and other materials for maintenance and repair, usually referred to as store-house stock, totaled $297,006,000, as compared with $197,960,000 in August, 1939. The increased storage of coal made to ease the strain on the car supply last year has accounted for approximately $20,000,000 of the total inventory increase. By way of comparison, the Class I railroads reported $502,986,000 of materials and supplies in stock at the end of 1917,—the year in which this country entered the first World War and this was an increase of $262,391,000, or 108 per cent, over the material balances in June, 1915.

Purchases of Material and Fuel—10 Months

Road	1941	Per Cent of Operating Revenue	1940	Per Cent Increase
A. C. & Y.	.....		$334,461	
Alton	$4,113,528	24.8	3,568,455	15
Alton & Sou.	430,156	...	280,224	53
Ann Arbor	939,515	23.6	872,159	7
A. T. & S. F.	47,397,004	25.6	36,761,624	29
A. B. & C.	869,496	22.3	634,254	37
A. C. L.	13,599,934	34.6	11,413,734	19
B. & O.	36,410,206	19.3	27,973,237	22
Bang. & Aroos.	1,027,097	22.1	997,204	2
Belt. Ry. of Chgo.	982,989	...	820,392	20
Bingham. & Garfield	133,840	...	194,559	–31
Bost. & Me.	10,033,359	20.3	6,981,423	43
Burl.-R. I.	88,076	8.8	48,234	83
Cambria & Ind.	193,069	12.3	126,581	53
Cent. of Ga.	4,175,361	22.9	3,395,848	23
Cent. of N. J.	8,514,955	23.4	6,947,463	22
Cent. of Vt.	1,670,155	25.6	1,351,342	23
Char. & W. C.	722,352	25.5	625,181	16
C. & O.	18,388,488	14.7	17,105,470	7
C. & E. I.	3,331,178	21.6	2,599,041	28
C. & I. M.	874,694	19.4	792,143	10
C. & N. W.	19,120,810	21.0	14,694,946	30
C. & W. I.	684,502	...	603,900	13
C. B. & Q.	20,060,459	20.8	16,267,606	23
C. G. W.	.....	...	3,270,838	..
C. I. & L.	.....	...	1,165,395	..
C. R. I. & P.	16,800,293	20.8	14,396,475	17
C. St. P. M. & O.	4,181,488	25.0	3,563,980	17
C. & G.	234,239	19.8	170,385	38
D. & H.	6,285,392	22.0	4,883,628	29
D. & R. G. W.	7,060,837	28.0	5,413,419	29
Det. & Mack.	140,551	21.0	122,298	14
D. & T. S. L.	373,978	10.4	282,255	32
D. T. & I.	836,646	11.3	856,493	–2
D. M. & I. R.	3,574,704	11.1	2,697,473	32
D. S. S. & A.	664,565	23.4	504,970	32
E. J. & E.	2,786,431	11.5	1,917,764	45
Erie	16,194,962	10.0	12,564,928	29
F. E. C.	2,038,373	21.4	1,985,475	2
Ft. W. & D. C.	1,295,482	24.3	1,135,442	14
Gt. Nor.	23,442,878	22.3	19,061,565	23
Gulf, Mob. & O.	3,275,055	16.8	.....	..
I. C.	31,113,945	27.0	23,272,886	33
Ill. Term.	929,857	16.0	891,324	4
K. C. Term.	840,074	...	739,166	14
L. S. & I.	349,486	11.0	285,261	22
L. & H. R.	322,537	17.4	220,467	46
L. & N. E.	736,641	16.4	460,844	60
Lehigh Val.	7,815,600	16.7	6,855,853	12
La. & Ark.	1,850,985	21.4	1,383,060	32
L. & N.	19,365,526	19.7	17,644,741	10
Me. Cent.	2,964,485	24.0	2,168,161	36
Miss. Cent.	184,615	18.5	201,114	–8
M-K-T.	5,040,222	17.5	3,033,631	66
Mo. Pac.	27,267,603	...	20,357,589	..
Montour	315,255	15.7	263,410	20
N. C. & St. L.	3,476,845	21.5	3,147,682	10
Nev. Nor.	337,656	58.0	217,182	55
N. Y. C.	86,506,514	21.8	66,205,162	30
N. Y. C. & St. L.	7,856,071	15.8	7,594,489	3
N. Y. N. H. & H.	15,124,585	16.4	11,609,624	30
N. Y. O. & W.	1,219,370	23.4	975,853	25
Nor. Pac.	15,499,148	22.2	11,674,599	32
Northwest Pac.	320,018	10.7	365,901	–13
Penna.-Long Is.	105,857,253	20.0	60,268,613	75
P.-R. S. S.	871,163	13.2	755,246	15
Pere Mar.	7,168,280	22.0	6,567,948	9
Pitt. & Shaw	167,087	19.5	275,076	–39
Pitt. Shaw. & Nor.	281,838	22.0	146,389	93
R. F. & P.	2,479,623	21.8	1,969,971	26
Reading	14,580,162	23.6	8,875,654	64
Rutland	919,526	29.1	632,209	46
St. L.-S. F.	12,187,432	24.4	7,558,675	61
St. L.-S. W.	5,931,274	20.3	3,810,369	55
Sea. Air Line	14,591,406	28.0	10,474,054	29
Sou.	30,920,051	20.6	22,599,963	36
Sou. Pac.	37,857,338	19.7	29,923,227	26
Tenn. Cent.	575,489	23.0	543,172	6
Term. of St. L.	2,381,339	...	1,550,648	..
T. & N. O.	8,654,850	17.7	6,493,234	33
Tex. & Pac.	6,437,166	24.5	4,960,605	30
U. P. Sys.	50,533,724	28.5	33,389,173	51
Utah	105,678	14.5	96,440	10
Virginian	3,681,908	16.1	5,556,952	–33
Wabash	10,039,686	21.1	9,229,963	9
West. Md.	5,449,983	29.1	3,495,435	56
West. Pac.	4,135,300	21.3	2,695,200	53
W. & L. E.	3,683,794	20.8	2,719,347	36

Materials Received and On Order*

	New Rail Received G. Tons	Cross Ties Received Units	Cross Ties Sold to U. S. Projects	Scrap Sold G. Tons	Rail on Order G. Tons	Materials On Order
Alton	4,976	285,839	None	9,582	....	.....
Alton & Sou.	1,051	19,372	None	611	750	$120,495
Ann Arbor	None	37,923	None	1,453	None	300,000
A. B. & C.	1,000	49,354	....	2,558	2,000	.....
A. C. L.	7,694	557,763	639	31,036	15,223	.....
Bang. & Aroos.	1,649	91,463	....	5,384	3,190	.....
Belt of Chicago.	1,200	57,000	None	11,416	2,000	.....
Bing. & Gar.	816	9,194	None	676	1,000	25,175
Boston & Me.	10,709	273,639	5,363	22,422	15,112	.....
Cambria & Ind.	300	17,569	None	657	250	45,635
Central of Ga.	3,297	313,851	....	17,380	6,845	.....
Central Vt.	828	21,060	3,967	2,526	943	375,000[3]
Char. & W. C.	520	22,233	None	1,367	None	.....
C. & E. I.	6,039	121,789	None	8,723	6,000	.....
C. & I. M.	1,848	15,755	None	1,644	1,850	200,000
C. & W. I.	1,200	29,000	None	7,021	1,100	.....
C. I. & L.	2,400	50,104	None	5,200	2,400	.....
Colo. & Sou.	....	....	....	5,688	....	.....
C. & G.	None	26,246	None	1,262	1,258	102,158[2]
Del. & Hud.	8,508	101,050	....	17,189	19,146	.....
D. & R. G. W.	11,645	81,843	4,000	24,309	10,990	2,845,908
Det. & Mack.	None	21,266	None	380	None	None
D. & T. S. L.	200	11,495	None	178	200	.....
D. T. & I.	None	22,927	None	2,655	3,000	.....
E. J. & E.	2,440	169,106	None	14,851	5,988	.....
F. E. C.	None	148,058	None	5,144	None	.....
Ft. W. & D. C.	None	129,000	None	2,466	None	.....
I. C.	53,912	2,071,289	51,000	79,741	68,215	9,753,554[3]
K. C. T.	777	26,487	1,400	29	905	.....
L. S. & I.	None	33,384	None	3,378	None	13,000
L. & H. R.	None	8,546	None	436	1,000	.....
L. & N. E.	None	7,511	None	679	3,665	.....
La. & Ark.	940	222,008	None	9,757	1,300	.....
Louis. & Nash.	13,427	654,924	10,829	60,257	None	.....
Me. Cent.	....	123,821	3,500	5,807	2,000	.....
Miss. Cent.	....	48,487	None	66	504	32,000
Mo.-Kans.-Tex.	520	447,467	None	9,922	3,500	1,612,166
Mo. Pac.	44,069	1,528,377	40,077	67,876	32,003	.....
Montour	500	1,600	None	734	None	27,000
N. C. & St. L.	640	144,827	None	14,777	6,400	.....
Nev. Nor.	429	39,741	None	141	None	.....
N.Y. N. H. &H.	13,247	123,000	33,849	38,094	24,364	.....
N. Y. O. & W.	None	9,800	None	4,350	None	25,000
N. Y. S. & W.	901	None	None	816	1,029	5,000
Nor. Sou.	None	None	None	2,133	None	.....
Nor. Pac.	38,775	923,527	None	57,851	43,600	.....
Pitts. & Shaw.	....	8,266	....	766	....	36,676
P. S. & N.	499	21,632	None	143	500	.....
Rutland	None	23,855	None	1,013	1,500	200,000[4]
St. L. S. F.	13,114	543,831	36,218	....	....	.....
Tenn. Cent.	1,023	88,010	....	1,752	2,000	295,214
Sou.	29,468	1,527,003	2,761	78	10,743	.....
T. & St. L.	1,320	25,741	....	2,985	4,776	125,000
T. & N. O.	4,413	644,008	None	27,619	17,792	.....
U. P.	80,565	1,534,675	79,300	109,365	86,000	.....
Utah	None	1,781	None	41	None	6,000
Va.	11,026	53,409	None	8,862	14,538	.....
Wabash	14,500	470,979	None	19,400	13,000	5,338,000[5]
W. Md.	5,076	214,438	None	10,980	5,000	1,728,636
W. F. & S.	None	9,250	None	42	None	None

* As of October 31, 1941.

[1] Excluding Rail and Cross Ties. [2] Including Rail and Fastenings. [3] Excluding $2,947,927 Cross Ties. [4] Excluding Fuel. [5] Excluding Equipment.

Consumption Proves Needs

Differences between the volume of new materials received each month and the material balances give a rough measure of material consumption. As indicated on one of the charts, the consumption of materials for maintenance and repairs has been increasing for 18 months. It was larger by approximately $13,000,000, or 39 per cent, in October than in August, 1939, and the total consumption of rails, ties and other materials for maintenance and repairs in the 27 months since August, 1939,

totaling $1,795,000,000, was almost 20 times the corresponding increase in aggregate material balances.

More Materials On Order

It is no secret that such success as the railroads have attained during the past two years in meeting their requirements of materials in the face of increasing delays in obtaining delivery of materials from the heavy industries, and the mounting expenditures for National Defense, is largely the result of placing orders for future delivery. Few railroads keep records of the value of these orders in the aggregate, but they now amount to $2,845,000 of unfilled orders on the Denver & Rio Grande Western, $9,753,000 on the Illinois Central, $1,612,000 on the Missouri-Kansas-Texas, $5,338,000 on the Wabash and $1,728,000 on the Western Maryland. Twenty-two railroads with 20,000 miles of line report a total of $23,211,000 of unfilled orders, from which it is roughly estimated that over $1,000,000,000 of materials, exclusive of equipment, are on order for the railroads at the present time.

Materials in Stock October 31, 1941

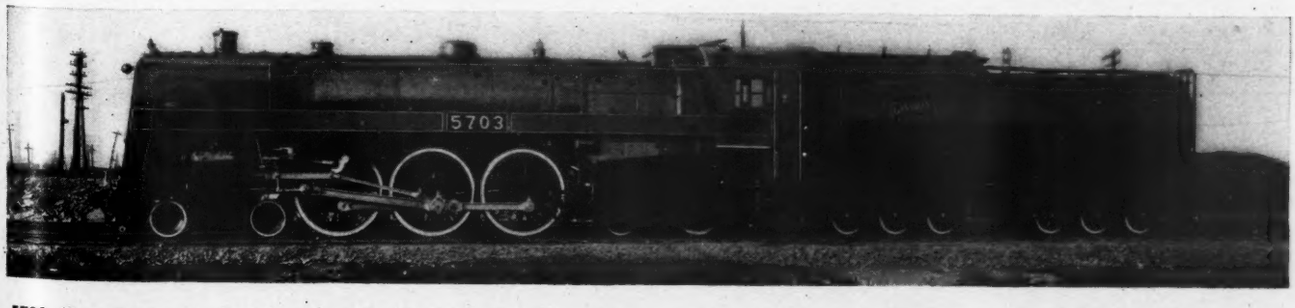
Road	Rail—New and S. H. Oct. 31, 1941	Rail—New and S. H. Per Mile	Crossties Oct. 31, 1941	Crossties Per Mile	Other Material Less Fuel Oct. 31, 1941	Other Material Less Fuel Increase Per Cent
Alton	$147,109	153	$78,448	82	$726,520	32
Alton & Sou.	33,396	400	9,243	110	99,721	59
Ann Arbor	83	..	11,165	40	201,726	17
A. T. & S. F.	1,298,407	92	6,821,820	51	16,288,657*	45
A. C. L.	192,500	38	332,090	65	3,564,819	59
B. & O.	546,755	86	1,088,029	170	9,439,069*	32
Bang. & Aroos.	54,760	91	83,923	139	624,691	–9
Belt of Chicago	35,064	76	77,410	167	243,383	1
Bing. & Gar.	6,484	195	14,863	450	38,158	–22
Bost. & Me.	68,055	31	535,222	278	2,752,876	35
Burl.-R. I.	1,634	6	9,938	39	31,796	–8
Camb. & Ind.	4,255	115	4,868	131	55,486	54
Cent. of Ga.	66,792	36	377,625	200	984,085	51
Cent. of N. J.	36,858	52	185,425	264	1,683,572	30
Cent. Vt.	77,021	183	80,345	190	391,669	15
Charl. & W. C.	3,779	11	10,235	300	180,236	36
C. & E. I.	13,828	15	132,935	143	903,154	61
C. & I. M.	35,019	270	14,350	109	395,844	51
C. & N. W.	635,787	76	1,690,693	202	6,435,970*	52
C. & W. I.	56,808	314	33,462	187	264,932	20
C. B. & Q.	548,262	60	2,191,383	242	4,822,836	21
C. R. I. & P.	665,322	84	1,200,044	151	5,376,736	7
C. St. P. M. & O.	138,996	85	360,391	220	981,079*	52
C. & G.	2,768	16	1,372	8	119,511	5
D. & H.	178,436	210	348,247	410	2,136,488	44
D. L. & W.	111,999	112	172,765	173	1,903,463	58
D. & R. G. W.	239,935	95	82,683	32	2,862,051	35
Det. & Mack.	26,444	109	19,586	81	125,792	–6
D. & T. S. L.	8,199	162	4,875	98	121,518	62
D. T. & I.	47,554	100	89,327	190	483,688	33
D. M. & I. R.	45,883	85	136,920	252	986,498	48
D. S. S. & A.	17,546	32	48,891	90	175,891*	26
E. J. & E.	158,105	41	118,209	303	1,070,642	42
Erie	220,686	100	793,148	345	3,689,834	59
F. E. C.	211,680	31	51,865	75	1,303,813	2
Ft. W. & D. C.	12,298	15	85,452	106	370,353	–9
G. N.	790,243	98	706,495	88	8,098,076*	30
Gulf, Mob. & O.	81,446	41	134,331	69	1,085,922	17
I. C.	217,471	33	475,680	72	8,645,783	70
Ill. Term.	13,142	28	73,816	153	331,158	7
K. C. Term.	1,146	6	35,881	200	211,713	57
L. S. & L.	34,135	218	18,793	120	267,575	20
L. & H. R.	1,346	14	8,214	85	82,340	62
L. & N. E.	9,218	49	23,388	123	419,678	90
Leh. Val.	90,660	71	269,259	212	1,794,295	11
La. & Ark.	103,982	117	132,327	150	618,056	6
Louis. & Nash.	367,437	126	2,223,763	460	7,387,785	37
Me. Cent.	15,350	15	111,060	111	968,973	30

Coal Piles Were Increased in 1941 to Relieve the Car Supply

Road	Rail—New and S. H. Oct. 31, 1941	Rail—New and S. H. Per Mile	Cross Ties Oct. 31, 1941	Cross Ties Per Mile	Other Material Less Fuel Oct. 31, 1941	Other Material Less Fuel Increase Per Cent
Miss. Cent.	6,269	41	10,024	68	66,698	46
Mo.-Kans.-Tex.	94,243	29	312,024	95	1,824,654*	27
Montour	18,731	370	1,898	37	164,088	9
N. C. & St. L.	60,167	55	426,076	384	1,594,343*	15
Nev. North.	20,507	124	28,134	170	104,947	39
N. Y. C.	1,709,939	155	4,135,827	376	28,135,788*	17
N. Y., N. H. & H.	404,445	218	581,924	315	4,853,129	41
N. Y. O. & W.	11,624	20	7,224	12	348,834	–7
N. P.	291,537	43	995,351	147	6,356,806	20
Pitts. & Shaw.	12,572	128	23,414	240	67,341	–6
Pitts., Shaw. & N.	26,710	141	5,252	27	74,600	40
R. F. & P.	.....	..	.....	..	1,127,360*	35
Reading	79,332	55	209,100	145	4,537,274	44
Rutland	23,106	57	27,550	68	271,800	49
St. L.-S. F.	174,639	36	559,836	113	2,880,839*	2
St. L.-S. W.	364,570	222	305,389	188	1,766,886*	35
Seaboard Air Line	230,657	53	361,248	84	5,100,741*	48
Southern	414,064	53	1,308,557	170	7,656,175	..
Tenn. Cent.	.....	..	15,490	54	250,094*	13
Term. of St. L.	16,135	44	14,016	38	415,047	41
Tex. & N. O.	27,018	6	516,172	117	2,884,535	38
Tex. & Pac.	414,884	218	207,936	110	3,007,900*	22
Union Pacific	3,437,429	350	1,391,264	141	21,741,969	45
Utah	29,528	218	42,628	384	186,577	12
Virginian	217,395	332	339,861	520	1,981,729	–27
Wabash	21,187	88	376,672	151	2,927,043	54
West. Md.	.....	..	371,813	310	1,282,828	25
West. Pac.	150,000	125	212,800	178	1,465,000	18
W. & L. E.	129,965	255	157,087	310	1,119,005	33

* Includes scrap.

* * * *



5700 Class Locomotives of the Canadian National Now Harmonize in Color with Passenger Coaches Beyond Them—Synthetic Green with Gold Stripe

Railroads Feel Rising Trend of Material Costs

War buying lifts most commodities—Government invokes ceilings and seeks co-operation of producers to prevent ruinous prices

By D. A. Steel
Purchases and Stores Editor

Tie and Timber Yard on Boston & Maine

LAST year the railroads were caught in a broad upsweep of prices which has been in progress since England declared war on Germany in 1939, and, as a result, average costs of railway materials have increased substantially, although not to the extent that would have occurred if railway supply manufacturers had not cooperated with defense agencies of the Government to keep prices from getting completely out of control.

Fuel Higher

Coal at the mines averaged 7 per cent higher last year than in 1940, and is now averaging 11 per cent higher than a year ago. Fuel oil costs averaged 5 per cent higher last year than in 1940, and have increased 10 per cent since 1939 when the upswing began. Gasoline averaged 9 per cent over 1940, with present values showing an increase of 20 per cent since a year ago and 27 per cent since August, 1939. Diesel fuel increased 1 per cent and now averages 8 per cent higher than 12 months ago and 7 per cent higher than the level in August, 1939.

This paper's average costs of materials in general are based on less complete information than for fuel and may not reflect all the changes in comparative costs to railroads, such as deviations from the usual allowances, discounts and extras, but as nearly as can be determined at this time, cross tie costs averaged 12 per cent higher last year than in 1940, and have increased 20 to 30 per cent since August, 1939, while lumber averaged 25 per cent over 1940, and averaged 50 per cent higher last October than in August, 1939. Rail at $40 a ton at the mills has been unchanged for several years, but the average costs of all iron and steel purchased by the railroads in 1941 were 3 per cent above 1940 and 11 per cent over 1929, with present prices indicating an average increase of 7 per cent since August, 1939. Miscellaneous materials, including products of copper and brass, averaged

Average Cost of Railway Materials and Fuel

1914	100	1924	189	1934	165
1915	107	1925	184	1935	167
1916	137	1926	183	1936	173
1917	177	1927	179	1937	186
1918	212	1928	178	1938	180
1919	216	1929	180	1939	175
1920	236	1930	173	1940	179
1921	187	1931	162	1941	189
1922	179	1932	151		
1923	194	1933	149		

5 per cent over 1940 and showed an average increase of 9 per cent since 1939.

Materials Up 12 Per Cent

This paper's weighted average cost of all materials and supplies, exclusive of fuel, for 1941, is 6 per cent above 1940, and indicates an increase of 12 per cent from August, 1939 to October, 1941, while the weighted average cost in 1941 of materials, including fuel, was 6 per cent higher than in 1940 and has risen about 11 per cent since August, 1939. Prices obtained by the railroads for their iron and steel scrap last year averaged 12 per cent higher than in 1940 and 40 per cent higher than in 1929, and indicate an average rise of 50 per cent since August, 1939.

Relative Costs of Railway Materials

	1941 to 1940 12 Mo. Index	1941 to 1929 12 Mo. Index	Oct., 1941 to Oct., 1940 Index	Oct., 1941 to Aug., 1939 Index
Coal*	107	100	111	109
Fuel oil	105	101	110	110
Gasoline	109	—	120	127
Diesel fuel	99	—	108	107
Total fuel	106	99	111	109
Cross ties	112	98	115	130
Lumber	125	120	125	150
Forest products	117	106	119	141
Rail	100	93	100	100
Iron and steel	103	111	105	107
Miscellaneous	105	87	109	109
Materials less fuel	106	103	108	112
Materials plus fuel	106	102	109	111
Scrap iron and steel	112	140	112	150

* Excluding freight.

The average cost of railway materials and fuel last year is represented by an index value of 189, as compared with 100 in 1914, 107 in 1915, 137 in 1916, 177 in 1917 and 212 in 1918, or putting it another way, railway material prices registered an average rise of about 37 per cent from 1914 to 1916 and a rise of 116 per cent from 1914 to 1919, as compared to an average rise of 11 per cent from August, 1939 to October, 1941.

Some Materials Unchanged

Commodities whose cost has changed little, if any, since August, 1939, include, besides rail, tie plates, track spikes, boiler tubes, bar steel, spring steel, steel tires, locomotive axles, brake hangers, gun iron and some sheet steel. Likewise, no appreciable changes have occurred in the average cost to the railroads of such chemicals as soda ash and lime for water softening and creosote. Cement, ballast, fire brick, boiler lagging, car oil, glass, oxygen for welding, boiler lagging, track insulation, lanterns and electric bulbs also remained relatively unchanged.

However, prices paid by railroads for track bolts show an average increase since August 1939 of 9 per cent, fence wire 4 per cent, track shovels 6 per cent, cast-iron pipe 12 per cent, machine bolts 10 per cent, brake shoes 17 per cent, chain 11 per cent, grey iron castings 9 per cent, malleable castings 10 per cent and steel castings 16 per cent. Couplers averaged 7 per cent higher last year than in August, 1939, pig iron averages 15 per cent higher, and freight car axles 9 per cent higher.

Since August, 1939, pipe fittings have risen 27 per cent, galvanized sheet steel 25 per cent, lag screws 12 per cent, Copper sheet is at least 14 per cent higher, lead 30 per cent, and journal bearings 35 per cent. Air brake hose is up 14 per cent, cotton waste 22 per cent, switch lamp oil 15 per cent, sheet rubber 15 per cent, leather belting 12 per cent, linseed oil 25 per cent, white lead 10 per cent, and car paint 9 per cent. Increases of 75 per cent for pine car siding, 30 per cent for pine sheathing and 100 per cent for fir sheathing for cars have been paid since early in 1939, while the cost of lumber for car sills and stringers shows an average increase of 90 per cent since that time.

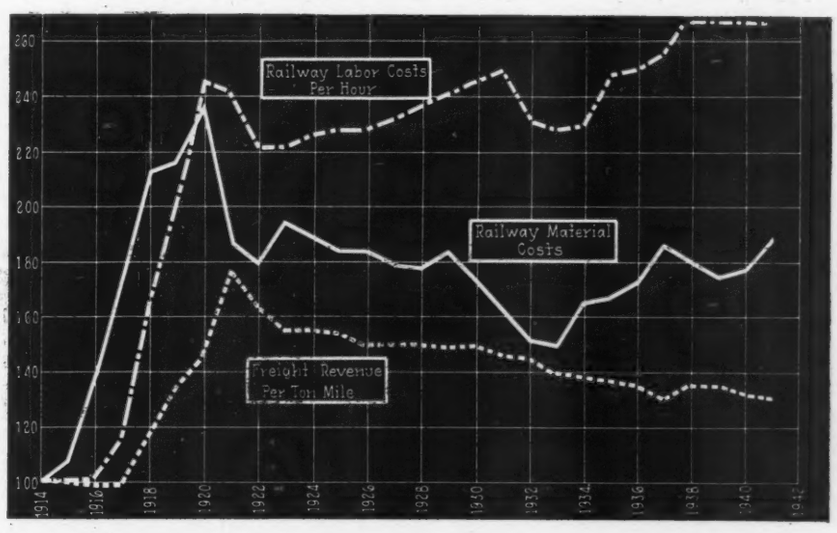
Comprehensive lists of cost of locomotive and car specialties and machinery have not been assembled. How-

Annual Average Cost of Coal for Locomotives—Class I Railroads*

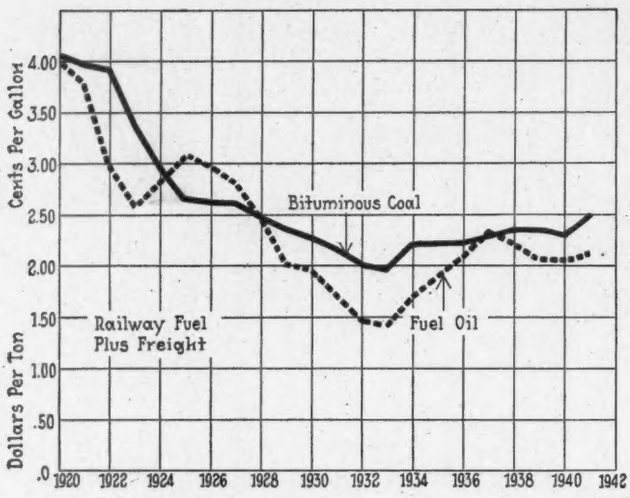
Dollars per Net Ton

	United States		Eastern		Pocahontas		Southern		Western	
	A	B	A	B	A	B	A	B	A	B
1924		3.03		3.11		2.13		2.78		3.22
1925		2.72		2.75		1.78		2.62		3.02
1926		2.63		2.67		1.82		2.31		2.94
1927	2.21	2.66	2.09	2.70	1.68	1.76	1.85	2.26	2.73	3.00
1928	2.12	2.53	1.95	2.55	1.61	1.69	1.81	2.19	2.66	2.82
1929	2.01	2.40	1.88	2.45	1.60	1.69	1.72	2.10	2.47	2.61
1930	1.95	2.34	1.83	2.39	1.60	1.68	1.67	2.06	2.39	2.53
1931	1.83	2.21	1.67	2.22	1.57	1.66	1.56	1.95	2.32	2.45
1932	1.66	2.05	1.46	2.04	1.49	1.58	1.41	1.79	2.17	2.31
1933	1.58	1.96	1.38	1.95	1.43	1.51	1.38	1.75	2.06	2.17
1934	1.83	2.20	1.75	2.33	1.69	1.77	1.64	2.00	2.10	2.19
1935	1.89	2.27	1.82	2.40	1.76	1.85	1.75	2.12	2.11	2.21
1936	1.79	2.34	1.78	2.48	1.75	1.93	1.74	2.21	1.83	2.28
1937	1.89	2.43	1.90	2.55	1.90	2.09	1.85	2.31	1.89	2.36
1938	1.92	2.51	1.94	2.68	1.97	2.19	1.90	2.41	1.89	2.37
1939	1.91	2.49	1.93	2.67	1.98	2.18	1.89	2.40	1.86	2.32
1940	1.88	2.45	1.91	2.61	1.96	2.17	1.89	2.37	1.82	2.30
1941†	2.00	2.55	2.03	2.73	2.13	2.33	2.00	2.48	1.89	2.33

* I. C. C. A is average mine price. B is cost of coal consumed, including freight and handling costs.
† 9 Mo. I. C. C.



All-Year Average Costs of Railway Material Compared to Wages Paid and Freight Revenue 1914 Equal 100



Year-Average Costs of Coal and Fuel Oil for Locomotives—Class I Railways

ever, pressure gages show an increase of 14 per cent over 1939, steam heat specialties are up 7 to 10 per cent, brake beams 8 per cent, storage batteries 5 per cent, water cranes 30 per cent, track jacks 7 per cent, steam cranes 34 per cent. The prices of lumber, castings, and forgings have been singled out for much criticism by railroads.

In general, freight car prices indicate a rise of at least 7 per cent since 1939, steam locomotives 18 per cent and car and locomotive specialties in the aggregate have been advanced 10 to 20 per cent since the beginning of the upswing in 1939.

Dealers quotations show considerable variation, according to some railroads and little according to others. Opinions also differ as to the degree of competition among dealers for railway business, some roads seeing practically no evidence of competition now that most dealers can get orders for all the material they can produce. The delivery situation is bad, as indicated more in detail elsewhere in this issue, but on the whole the railroads appear to be having little trouble in obtaining the quality of material called for in their specifications. Lumber prices have declined in recent months and further declines are in prospect but with this exception most of the railroads anticipate still higher material costs in 1942.

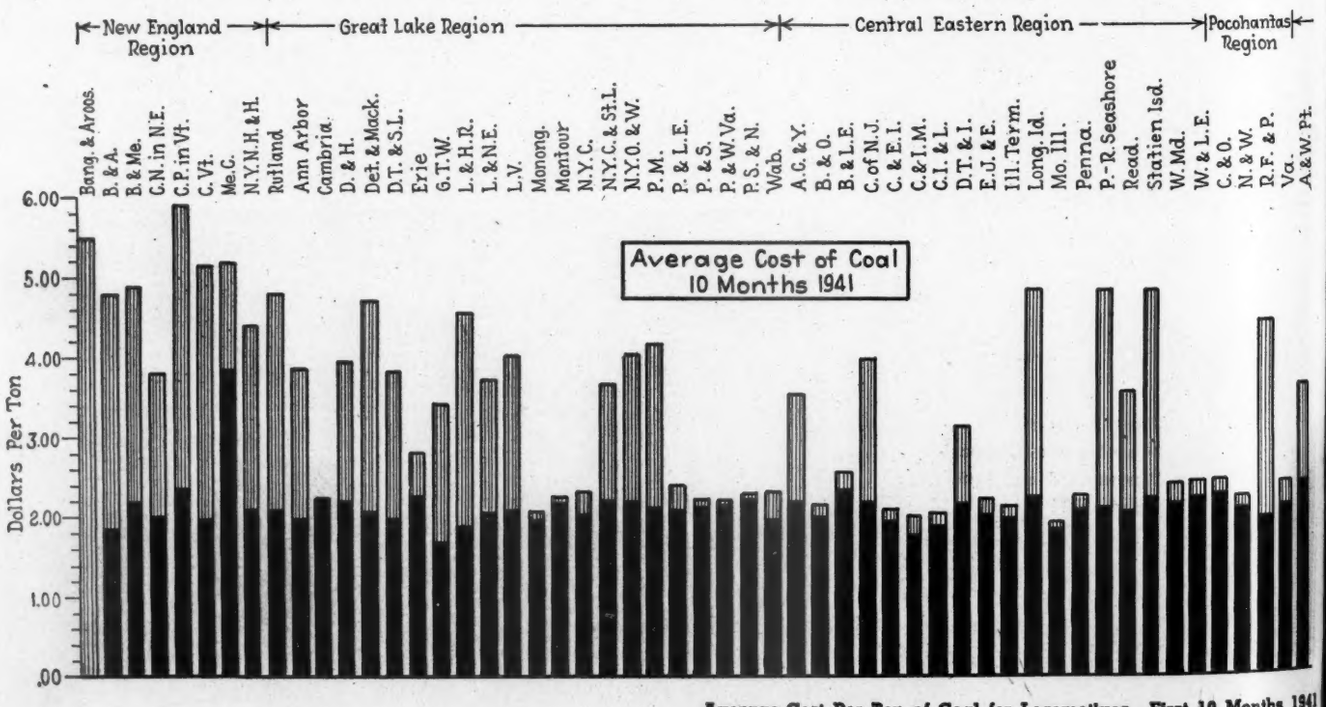
More Fuel Rules

Railway coal costs were all increased slightly in in October, 1940, when the Government, acting under the Bituminous Coal Act, put into effect its long-materializing minimum prices for the purpose of maintaining a cost floor under coal and regulating trade practices, and these prices extended into 1941. Coal costs for 1941 delivery were again increased from 10 to 20 cents a ton last May, following a nation wide strike over wages which practically stopped bituminous coal mining for 6 weeks. Many railroads stored coal in anticipation of this strike at costs of 30 to 40 cents a ton and many railroads were compelled to go to more distant fields for coal during

Average Costs of Fuel Oil—Class I Railroads

	Cents per Gallon — Fuel Oil — United States	Eastern District	Southern District	Western District	Gasoline	Diesel Fuel
1920	3.97	9.17	3.49	3.97	....	...
1921	3.77	5.91	4.22	3.75	....	...
1922	2.98	4.75	3.40	2.96	....	...
1923	2.58	7.77	3.05	2.48	....	...
1924	2.80	4.52	3.61	2.75	....	...
1925	3.18	4.67	3.89	3.11	....	...
1926	2.95	4.87	3.92	2.87	....	...
1927	2.80	4.66	3.68	2.73	11.78	...
1928	2.46	3.53	2.69	2.43	11.26	...
1929	2.10	3.24	2.28	2.07	11.08	...
1930	1.99	3.23	2.27	1.95	9.84	...
1931	1.71	2.54	1.87	1.69	6.98	...
1932	1.49	2.17	1.49	1.47	7.12	...
1933	1.37	2.50	1.90	1.30	7.10	...
1934	1.73	3.40	2.90	1.70	7.60	...
1935	1.90	3.10	2.50	1.90	7.80	...
1936	2.10	3.55	2.61	2.04	8.33	3.84
1937	2.35	3.70	2.97	2.30	8.81	4.39
1938	2.21	2.93	2.67	2.18	8.03	4.45
1939	2.01	2.93	2.39	1.98	7.97	4.40
1940	2.02	3.20	2.87	1.97	8.10	4.48
1941*	2.12	3.69	3.04	2.09	8.83	4.45

* 9 Mo. I. C. C.



Average Cost Per Ton of Coal for Locomotives—First 10 Months 1941

the strike, which added still more to coal costs because of the additional freight charges incurred. Many roads also stored coal last summer as a protection during the fall when coal traffic was expected to exceed the car supply. For the most part, this protection proved unnecessary but it added still more to the cost of coal to some railroads. Other expenses chargeable to coal were incurred by some roads last November as a result of a shutdown in captive mines over a closed shop issue.

In view of the elaborate preparations which had been made over a period of about five years to bring prosperity back to the coal industry by establishing minimum prices, it is noteworthy, to say the least, that the Office of Price Administration of the Government issued an order on April freezing bituminous prices at the levels in effect on March 28 until the strike was settled and that in September the Bituminous Coal division, charged with the administration of minimum prices, held hearings to consider proposals to prescribe maximum prices on bituminous coal to protect consumers from any unreasonable increases. While no general action appears to have been taken in this respect, various adjustments were made to equalize prices between districts, these adjustments including revisions of minimum prices for the shipment of off-line locomotive coal from Indiana and Illinois to several midwestern railroads, including the Grand Trunk Western; the Chicago, Burlington & Quincy; the New York Central and the Pennsylvania. At the same time, the Government took action against numerous producers and dealers for violations of minimum price regulations, which included cases of the unauthorized substitutes of higher-priced coal to fill railroad contracts for lower-priced coal.

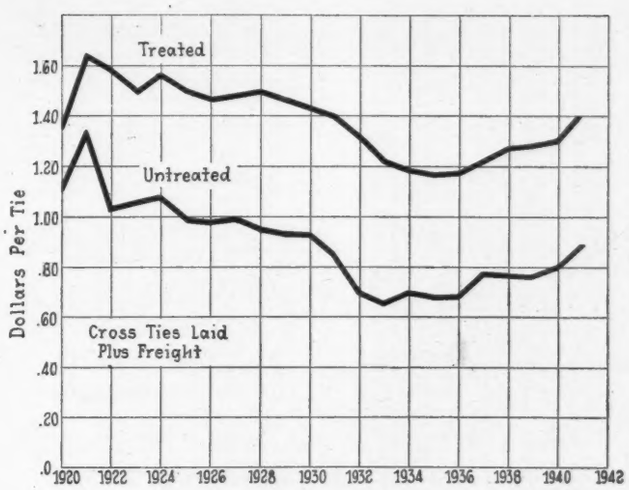
As early as October, the Government began recalculating coal production costs with a view to passing any profits on to the public and these investigations resulted in proposals to reduce the prices in some areas and increase them in others, but the unions had pretty well

Average Cost of Cross Ties Laid in Replacement—Class I Railroads

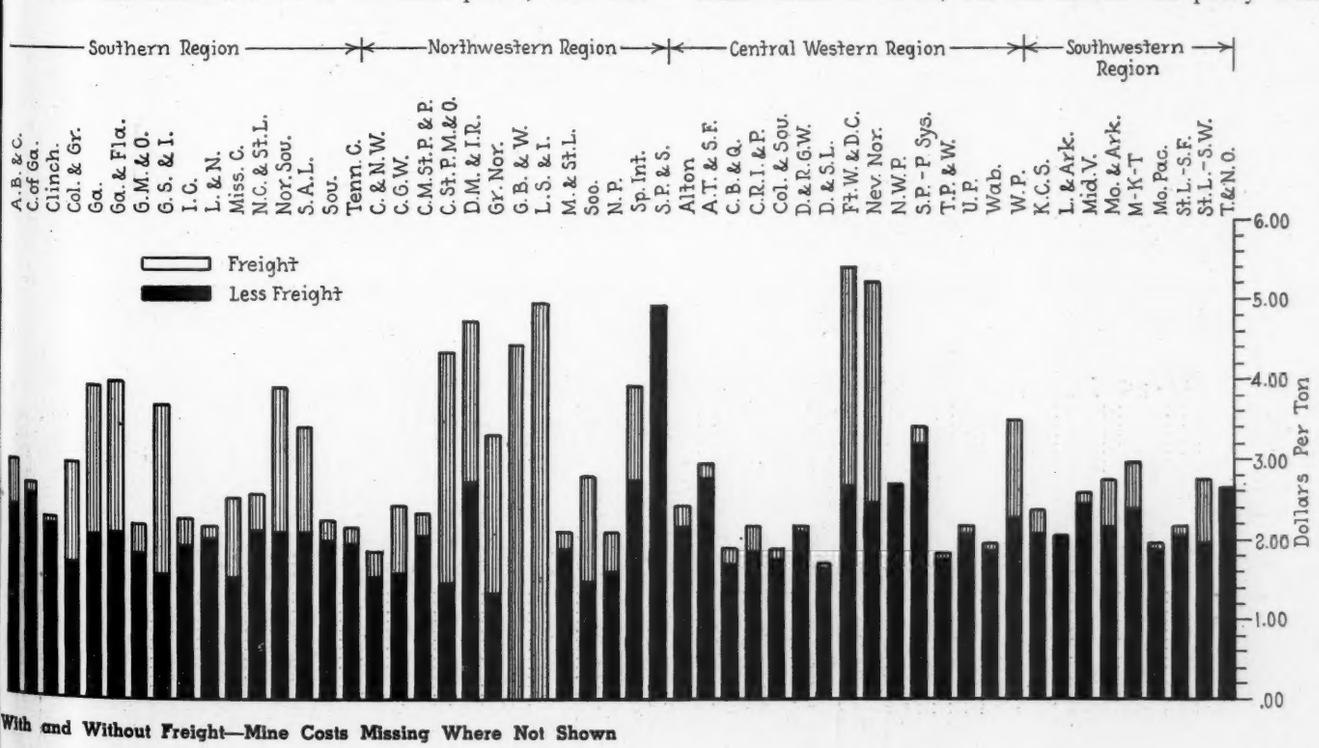
Dollars per Tie

	Untreated				Treated			
	United States	Eastern Dist.	Southern Dist.	Western Dist.	United States	Eastern Dist.	Southern Dist.	Western Dist.
1920	1.20	1.36	1.29	.93	1.35	1.48	1.34	1.26
1921	1.34	1.76	1.21	1.08	1.64	2.10	1.55	1.39
1922	1.03	1.46	.87	.88	1.58	1.99	1.42	1.33
1923	1.05	1.38	1.02	.90	1.49	1.87	1.23	1.26
1924	1.07	1.58	1.07	.91	1.56	1.91	1.44	1.35
1925	.99	1.25	1.02	.85	1.49	1.92	1.39	1.29
1926	.98	1.23	1.04	.81	1.46	1.83	1.37	1.25
1927	.99	1.26	1.04	.82	1.48	1.89	1.40	1.28
1928	.95	1.21	.97	.83	1.49	1.89	1.44	1.29
1929	.93	1.13	.97	.81	1.46	1.88	1.35	1.27
1930	.92	1.12	.95	.82	1.43	1.81	1.34	1.26
1931	.84	1.00	.87	.77	1.39	1.76	1.30	1.25
1932	.70	.92	.70	.66	1.32	1.66	1.24	1.18
1933	.65	1.03	.63	.57	1.22	1.56	1.09	1.09
1934	.69	.77	.77	.57	1.18	1.50	1.07	1.06
1935	.68	.77	.72	.60	1.17	1.45	1.06	1.07
1936	.68	.72	.76	.59	1.18	1.42	1.10	1.08
1937	.77	.80	.87	.67	1.22	1.50	1.17	1.10
1938	.76	.75	.89	.65	1.27	1.54	1.26	1.16
1939	.75	.77	.86	.66	1.28	1.52	1.29	1.16
1940	.79	.75	.90	.68	1.29	1.54	1.29	1.16
1941*	.91	.86	1.04	.79	1.48	1.78	1.50	1.35

* Ties purchased, 9 Mo.
Source I. C. C. Excludes labor.



All-Year Average Costs of Treated and Untreated Cross Ties Laid in Replacement—Class I Railways

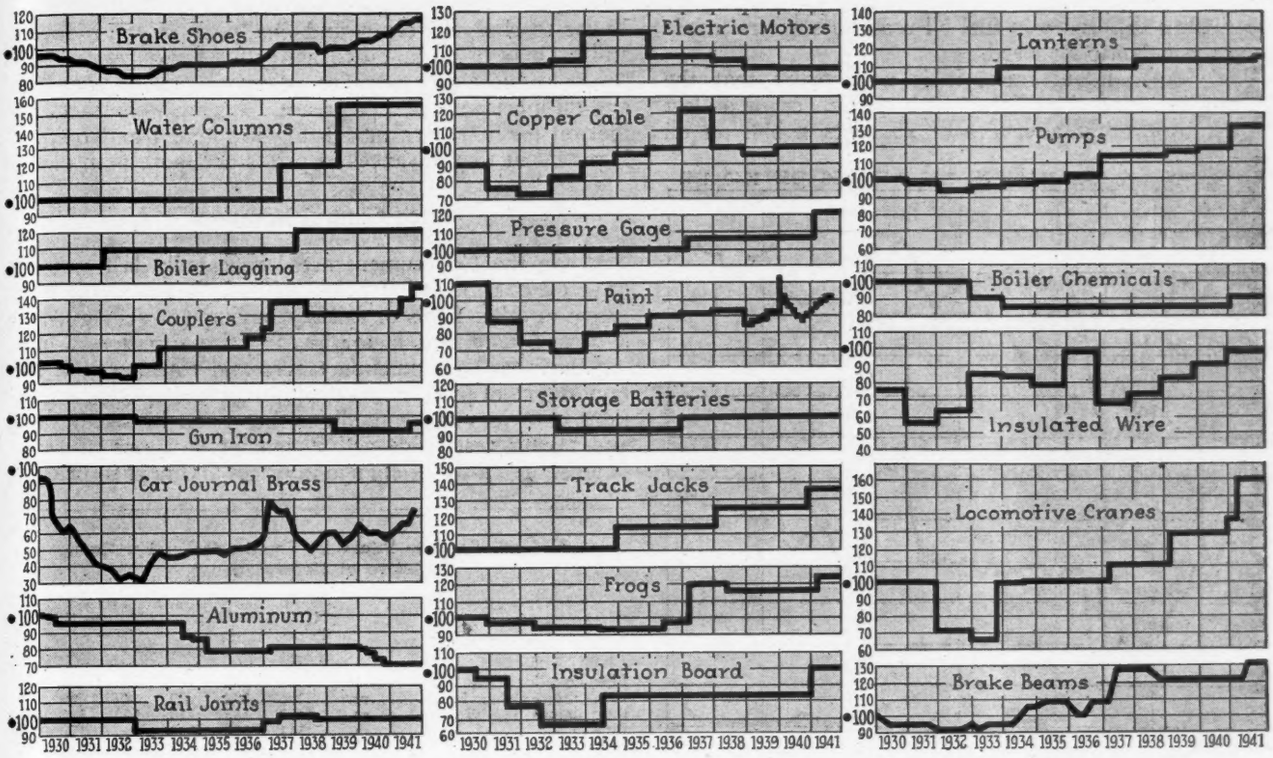


With and Without Freight—Mine Costs Missing Where Not Shown

Average Unit Costs of Railroad Materials—1927-1941*

Description			1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941 First quarter	1941 Mid. year	1941 Last quarter	1941 Average	Per cent of 1940	Per cent of 1929	Oct. 1941 % of Oct. 1940	Oct. 1941 % of Aug. 1939
TRACK MATERIALS																								
Rail		N.t.	$43.00	$43.00	$43.00	$43.00	$43.00	$42.00	$38.79	$36.37	$36.37	$36.375	$41.33	$41.66	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	100	93	100	100
Tie plates	Steel	N.t.	45.98	42.43	42.10	41.22	38.88	36.40	36.64	39.56	38.73	39.91	44.93	45.45	43.70	43.74	44.21	43.71	43.71	44.00	101	105	100	100
Track bolts	Heat-treated	Cwt.	4.00	3.83	3.75	3.94	3.74	3.42	3.52	3.71	3.71	3.87	4.40	4.50	4.31	4.34	4.46	4.63	4.69	4.60	106	122	108	109
Track spikes	High-carbon steel	Cwt.	2.80	2.76	2.71	2.68	2.57	2.45	2.32	2.46	2.46	2.68	3.09	3.54	3.03	3.02	3.01	3.03	3.03	3.02	100	111	100	100
Track shovels	No. 2 carbon steel	Doz.	12.95	13.82	11.28	10.02	9.98	10.93	11.53	13.20	13.26	12.70	13.02	13.70	13.51	13.63	13.74	13.93	14.66	14.10	103	126	108	108
Wire fence	26-49 in. woven	Rod	.467	.488	.426	.428	.396	.383	.370	.402	.416	.403	.502	.516	.490	.503	.49	.49	.49	.49	98	115	98	104
Steel, structural	Angles	Cwt.	1.98	1.98	2.35	1.98	1.84	1.73	1.75	1.93	1.96	2.19	2.48	2.48	2.37	2.51	2.55	2.55	2.55	2.55	102	108	101	109
Pipe, cast-iron	12 in. Class B	N.t.	41.13	41.13	39.41	40.37	35.58	33.94	37.91	40.80	40.60	42.25	42.99	50.58	48.57	49.25	45.00	45.50	46.00	46.00	106	115	102	107
Pipe, culvert	24 in. corr.	Ft.	...	...	...	...	...	1.95	1.74	2.02	2.16	2.19	2.54	2.59	2.34	2.38	2.39	2.74	2.45	2.52	105	...	104	106
Ballast	Crushed rock	C.y,	...	...	...	...	...	...	...	...	...	...	1.05	.88	.89	.89	.87	.88	.89	.88	99	...	125	100
LOCOMOTIVE AND CAR MATERIALS																								
Bolts, with nuts	¾ x 6, machine	100	5.13	5.02	4.87	4.81	4.20	4.04	4.70	4.59	4.08	3.97	4.93	4.75	4.36	4.52	4.68	4.91	5.08	4.90	108	100	110	120
Boiler tubes	2 in. No. 11 steel	Ft.	.172	.172	.174	.154	.152	.152	.156	.161	.161	.158	.166	.165	.154	.158	.157	.157	.157	.157	100	90	100	102
Bar steel	Open-hearth	Cwt.b.	2.13	2.58	2.17	1.85	1.80	1.72	1.73	1.84	2.01	2.09	2.49	2.47	2.27	2.18	2.08	2.26	2.26	2.20	101	101	103	100
Steel	High-speed tool	Lb.b.	.59	.58	.57	.66	.52	.49	.52	.60	.61	.64	.78	.80	.77	.80	.72	.73	.73	.73	91	128	93	95
Steel	Boiler	Cwt.b.	2.01	2.00	2.33	2.01	1.86	1.73	1.82	2.10	2.05	2.12	2.53	2.40	2.25	2.20	2.23	2.23	2.26	2.24	102	97	100	100
Steel	Spring	Cwt.b.	2.74	2.63	2.84	2.62	2.42	2.18	2.23	2.31	2.36	2.54	3.03	2.94	2.81	2.88	2.91	3.00	3.02	2.97	103	104	105	108
Steel	24-gage black	Cwt.	3.20	2.99	3.25	2.90	2.65	2.69	2.68	2.72	2.81	2.82	3.28	3.13	2.80	2.91	2.84	2.84	2.84	2.84	98	87	83	102
Pig Iron	No. 1	G.t.	20.50	20.50	17.35	16.61	15.37	14.85	15.74	18.30	18.59	19.47	22.13	20.97	19.85	20.97	21.61	22.12	22.25	21.99	100	126	102	117
Brake shoes	Loco. driving	N.t.	61.70	61.70	59.54	60.00	56.28	54.28	54.50	56.30	56.65	56.65	61.36	62.70	63.90	65.91	68.40	69.00	70.40	69.20	105	128	105	111
Brake shoes	Freight car	N.t.	36.93	39.98	37.55	35.42	35.12	32.70	33.40	35.00	36.00	37.77	48.27	48.50	48.50	50.10	53.80	54.30	55.60	54.70	109	146	108	108
Castings, grey iron	Green sand	Cwt.	3.86	3.97	4.12	4.12	4.00	3.82	3.82	3.90	3.87	4.14	4.25	4.15	4.10	4.20	4.15	4.12	4.34	4.16	99	101	104	106
Castings, malleable	7-15 lb. 25-100	Cwt.	9.13	8.50	8.68	8.27	7.68	7.59	7.42	8.99	8.29	8.42	10.38	10.50	10.60	11.31	12.27	12.40	13.28	12.60	111	145	118	123
Castings, steel	25-50 lb. under 50	Cwt.	8.64	7.97	8.32	8.46	7.73	7.37	7.25	8.52	8.49	8.52	11.91	12.50	12.10	12.33	12.57	13.49	13.80	13.30	107	160	112	114
Couplers, car	5 x 7 x 6½ AAR-E	Pr.	41.20	40.20	40.20	41.20	39.20	38.13	37.20	40.20	40.20	42.43	51.70	51.50	51.00	50.87	51.50	53.60	55.90	53.50	113	132	123	110
Wheels, car	33 in. chilled iron	Cwt	.	...	...	...	...	...	1.35	1.40	1.40	1.40	1.50	1.24	1.27	1.40	1.41	1.43	1.48	1.44	101	...	105	117
Wheels, car, steel	33 in. tender 800-lb.	Ea.	...	...	...	...	...	...	...	...	...	...	30.60	34.53	33.64	34.14	39.70	39.70	39.70	39.70	118	...	120	117
Axles, loco.	Driving,carbon	Cwt.	5.16	5.21	4.84	4.29	4.75	4.55	4.56	4.90	5.06	5.26	5.94	5.80	5.83	5.73	5.96	5.96	5.96	5.96	104	123	104	102
Axles, car	5 x 9, rough turned	Cwt.	2.94	2.94	2.94	2.88	2.88	2.75	2.53	2.89	2.98	3.09	3.61	3.54	3.41	3.50	3.53	3.53	3.53	3.53	101	120	98	103
Tires, frt. loco.	33 in., rough bored	Cwt.	6.11	6.11	5.84	6.22	6.03	5.86	5.55	5.67	5.97	5.83	6.21	6.20	6.12	6.08	6.84	6.84	6.84	6.84	115	117	112	111
Pipe	1 in. black steel	Ft.	.076	.069	.066	.067	.069	.063	.063	.066	.069	.062	.073	.074	.070	.067	.066	.067	.067	.067	100	101	105	119
Wire nails	Common	Cwt.	2.58	2.62	2.62	2.29	2.07	2.18	2.23	2.62	2.83	2.28	2.71	2.72	2.51	2.61	2.64	2.64	2.77	2.65	101	101	104	111
Pig lead	Virgin	Cwt.	7.04	6.43	6.95	5.64	4.42	3.53	4.17	4.04	4.44	4.87	6.34	5.12	5.30	5.33	5.78	6.32	6.63	6.25	117	90	124	130
Copper	Sheet, soft	Lb.	.218	.23	.27	.259	.181	.180	.169	.180	.211	.212	.252	.249	.245	.244	.270	.270	.272	.271	111	100	110	112
Journal bearings	AAR	Lb.	.142	.141	.167	.149	.10	.07	.081	.093	.096	.106	.139	.114	.122	.130	.133	.140	.152	.141	108	85	117	136
Wire, copper	No. 9 bare	Lb.	.149	.167	.195	.163	.115	.100	.113	.138	.141	.142	.185	.163	.165	.170	.174	.175	.176	.175	103	90	105	112
MISCELLANEOUS																								
Boiler lagging	1¼x6x36 mag	Sq. ft.	.21	.22	.236	.160	.155	.156	.156	.157	.160	.154	.183	.182	.183	.183	.194	.194	.194	.194	106	82	103	106
Fire brick	Soft	M	41.74	43.08	41.73	41.85	39.29	34.70	37.20	44.58	45.26	45.64	50.42	49.75	49.20	46.74	42.00	42.00	43.00	42.10	90	101	94	88
Hose, air brake	Air brake, 1⅜x22	Ft.	.48	.46	.44	.45	.37	.33	.31	.39	.41	.40	.44	.38	.36	.34	.34	.35	.39	.36	106	82	117	111
Leather	Belting, 6 in. double	Ft.	1.22	1.35	1.39	1.39	1.23	1.27	1.17	1.32	1.31	1.32	1.30	1.26	1.24	1.30	1.34	1.35	1.36	1.35	104	97	105	110
Rope	¾ in. manila	Lb.	.217	.199	.199	.189	.153	.142	.127	.142	.130	.167	.180	.168	.154	.170	.162	.167	.182	.170	100	85	112	124
Cable	¾ in. 6x19 steel	Ft.	.125	.119	.144	.14	.143	.132	.137	.155	.161	.161	.174	.174	.163	.164	.15	.15	.15	.15	94	104	100	94
Rubber, red	⅛ in. sheet packing	Lb.	.32	.28	.247	.25	.225	.176	.172	.177	.167	.131	.141	.137	.135	.16	.142	.144	.157	.148	93	60	99	116
Oil	Switch lamp—tanks	Gal.	.096	.09	.087	.117	.062	.061	.051	.053	.052	.055	.055	.059	.055	.058	.060	.061	.060	.061	106	70	105	109
Oil	Car-tank lots	Gal.	.180	.157	.157	.163	.138	.127	.134	.135	.132	.141	.132	.144	.147	.142	.142	.143	.145	.143	100	91	100	100
Grease	Driving box	Lb.	.160	.122	.125	.131	.122	.118	.109	.104	.103	.102	.101	.100	.099	.100	.103	.104	.105	.104	103	83	105	106
Waste	Colored cotton	Lb.	.098	.091	.086	.084	.076	.051	.057	.065	.057	.073	.079	.058	.060	.067	.064	.066	.073	.068	99	79	107	123
Creosote oil	Tank lots	Gal.	.157	.157	.145	.130	.115	.108	.093	.106	.116	.109	.123	.125	.130	.122	.123	.123	.124	.123	96	86	101	101
Glass	24 x 24 dsa	Box	5.23	5.10	5.76	5.84	4.80	4.71	5.18	4.59	5.03	4.81	5.60	5.25	5.06	5.00	5.06	5.01	5.04	5.03	100	87	104	104
Linseed oil	Boiled	Lb.	.088	.093	.117	.120	.09	.068	.087	.095	.103	.104	.117	.10	.096	.097	.76	.84	.87	.83	114	71	131	92
White lead	In oil—100 lb. keg	Lb.	.11	.102	.104	.106	.107	.088	.08	.081	.085	.085	.100	.086	.091	.097	.084	.100	.104	.100	96	97	107	115
Cement, Portland	In paper	Bbl.	2.21	1.85	1.87	1.76	1.42	1.42	1.80	1.95	2.16	2.02	1.98	1.98	1.99	1.97	1.97	1.97	1.97	1.97	100	105	100	101
Soda ash	Water softening	Cwt.	1.33	1.40	1.46	1.56	1.55	1.30	1.21	1.31	1.32	1.30	1.20	1.17	1.20	1.21	1.25	1.25	1.25	1.25	103	86	103	104
Hydrated lime	Water softening	N.t.	13.63	11.99	11.96	9.73	9.53	9.49	8.35	8.50	8.48	8.59	9.47	9.60	8.46	8.05	8.10	8.15	8.40	8.25	103	69	104	105
Oxygen		00 Cu.ft.	1.29	1.04	1.03	1.05	1.06	1.02	1.04	1.10	1.06	.94	.91	.90	.82	.86	.84	.84	.84	.84	98	81	98	102
Incandescent lamps	100 W., 110 V. frosted	Ea.	...	...	...	...	...	...	...	...	...	...	.161	.128	.116	.111	.137	.137	.137	.137	123	...	126	131
Lanterns, Hand	clear globes	Doz.	...	...	14.80	14.80	14.80	14.80	15.10	16.00	16.00	16.00	16.00	16.75	16.75	16.75	16.75	16.75	17.00	16.83	100	194	101	101
Car siding	1x6x9 B&B fir	M. ft.	...	...	...	...	...	18.76	25.14	31.40	32.10	32.50	34.16	30.56	35.78	45.56	...							
Car siding	1x6x9 B&B pine	M. ft.	...	...	...	...	...	...	...	...	...	...	47.11	39.83	40.91	44.50	51.99	58.00	61.50	57.00	128	...	124	160
Car sheathing	2x6x18 B&B fir	M. ft.	...	...	...	...	...	21.83	36.75	45.00	37.29	47.22	41.50	30.40	35.20	41.60	50.30	66.50	63.50	60.00	144	...	132	195
Car sheathing	2x6x18 B&B pine	M. ft.	...	...	...	...	...	...	...	...	...	...	45.52	40.36	40.73	48.00	...							
Car sills	6x6 com. rgh., fir	M. ft.	...	...	...	...	...	10.23	13.00	19.00	17.98	20.20	23.96	20.80	20.37	23.00	32.36	38.33	39.80	36.80	160	...	146	121
Br. stringers	16"x32' or less, fir	M. ft.	...	...	...	...	...	12.52	15.70	23.50	21.15	20.69	23.23	19.61	19.76	23.80	28.70	33.80	40.04	34.10	144	...	148	210
Crossties	7x9x8'6, fir	Ea.	.60	.60	.67	.80	.50	.50	.49	.53	.49	.53	.61	.53	.42	.52	...	...	...	...	...	...	...	...
Crossties	7x9x8'6, pine	Ea.	.67	.67	.67	.77	.65	.73	.64	.62	.57	.72	.77	.73	.75	.80	.92	.94	1.01	.95	119	141	120	135
Crossties	7x9x8'6, white oak	Ea.	.98	.95	.93	.92	.83	.75	.69	.69	.67	.82	.96	.82	.84	1.05	1.10	1.10	1.18	1.12	106	120	110	140
RAILROAD SCRAP (SOLD)																								
	No. 1 wrought	N.t.	11.16	11.39	11.96	8.68	7.20	4.20	6.65	7.96	9.07	12.20	13.20	9.90	12.70	14.40	14.60	15.84	16.50	15.64	108	131	105	143
	No. 1 heavy melt	N.t.	11.63	11.34	12.82	10.62	7.33	5.34	7.32	8.55	9.29	12.32	14.44	11.70	13.83	15.93	19.00	18.50	18.50	18.60	117	145	106	151
	Rails for re-rolling	N.t.	13.80	12.92	14.49	12.55	10.05	7.18	8.10	9.22	9.89	13.21	15.97	14.00	15.95	18.78	21.80	20.40	20.40	20.80	111	143	101	144

* Compiled from special reports made by railroads to the *Railway Age*.



Comparative Trend in Costs of Special Materials and Appliances—1929 Equals 100

taken care of the increased earnings on coal mining and little expectation of reductions in coal prices is now entertained by the railroads, attention being directed more recently to the problem of producing sufficient solid fuels to meet all demands, as outlined in a special meeting called by the Secretary of the Interior on December 12.

Railroads appear to be using less and less anthracite coal; neither is their consumption of coke large, but it is noteworthy that the Government placed a temporary ceiling on hard coal prices in September to block a proposed increase of 15 cents a ton at the mines, pending investigation of the entire hard coal situation, and also took action in the same month to freeze coke prices at existing levels, which were from $1.00 to $1.25 a ton higher than a year previous.

Fuel Oil and Gasoline

Fuel oil prices are still largely determined by available supplies and competition between different fields, but no oil went begging for buyers in 1940. In general, the 1940 prices to railroads continued into 1941 until April when advances in domestic crude oil brought increases of 6 cents to 10 cents a bbl. in the contract prices of fuel oil at refineries, and spot prices were considerably higher than June on, with a result that fuel oil prices to railroads were raised 7 to 8 per cent over the corresponding costs in 1940. The shipping by rail of much petroleum which had previously moved by water

Maximum Shipping Point Prices for Southern Pine Car Lumber, Dollars Per 1000 Bd. Ft.

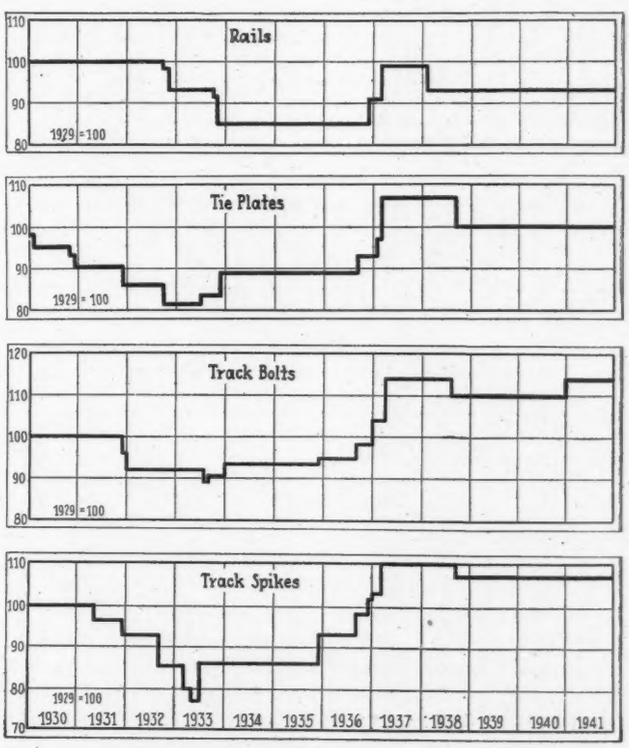
	9 Ft.	10 Ft.	12 Ft.	14 Ft.	16 Ft.	18 Ft.& 20 Ft.
1 x 4 and 6 KD & D.....	60	55	57	60	62	68
1 x 4 and 6 Com.....	40	35	37	40	42	45
1 x 4 and 6 Vert. KD & D..	60	55	57	60	62	68
1 x 4 and 6 Vert. Com.....	50	45	47	50	52	58
2 x 4 Long. KD & D.....	67	57	57	57	62	67
2 x 6 Long. KD & D.....	72	62	62	62	67	72
2 x 4 Long. Com.....	47	42	42	42	45	47
2 x 6 Long. Com.....	52	47	47	47	50	52
2 x 6 and 8 KD & D.....	44.50	42.50				
2¼ to 3 x 6 and 8 KD & D..	47.50	45.50				

For Dense Flooring,, Add $2.50.

For final inspection at point of destination, add $5.00. For grades and specifications other than A. A. R., the maximum price shall be the price for the A. A. R. grade and specification which most closely corresponds.

For mixed car or mixed truck shipments, $1.00 additional per 1,000 bd. ft. measure may be charged.

A delivered price in excess of the maximum f.o.b. mill prices may be charged, consisting of maximum prices plus actual transportation costs paid by the seller.

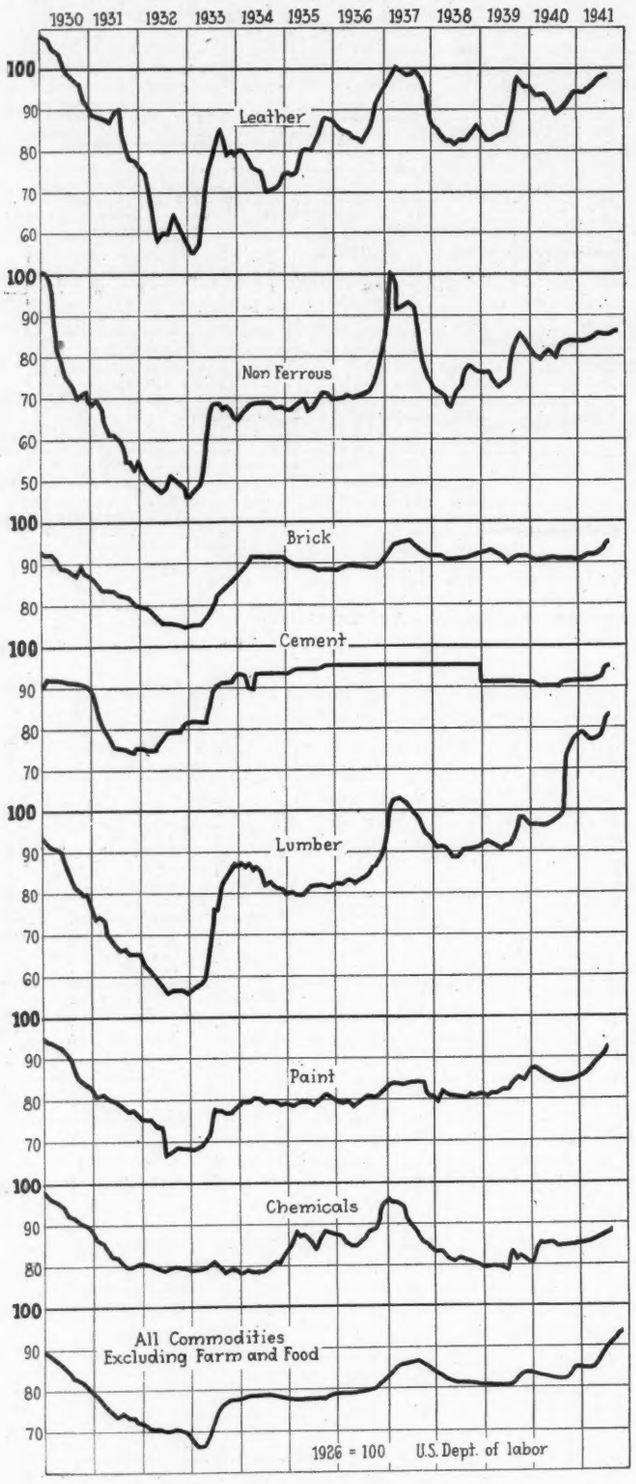


Comparative Trends in Base Prices of Track Materials—1929 Equals 100

* Compiled from special reports made by railroads to the *Railway Age*.

also made a difference in fuel oil costs to some railroads along the Atlantic seaboard.

With other liquid fuels, it is noteworthy that the Government froze the price of Pennsylvania crude oil last August to prevent advances of 25 cents a bbl. on oil



Comparative Month-to-Month Trends in Wholesale Prices

which had previously been increased 50 per cent, and it intervened several times to control prices in the west,—once in July to request Gulf Coast refiners not to charge more than 6 cents per gal. for gasoline; again in September to authorize 6½ cent gasoline; again on November 6 to object to proposals of refiners in North Texas to charge 7 cents, and finally to order producers and refiners of crude oil to notify the government of all future proposals to advance prices of fuel oil, gasoline and all lubricants, except grease. Railroad contracts for fuel oil for 1941 are now being negotiated and opinion is prevalent that advances in prices are more than likely.

Price Control Rampant

While the Government acted repeatedly last year to head off the mounting prices of fuel, it was even more active in other fields of railway buying (or selling), and became a dominant factor in the price situation, arousing the interest of manufacturers and consumers in the importance of price control here, imposing specific limitations on prices of commodities there, and by seeking out and taking restrictive action against violators of regulations. Next to the change in prices and next to priority regulations, the Government's price regulation was easily the outstanding development of the last year. At the beginning it was the Price Stabilization Division of the Advisory Commission to the Counsel of National Defense which took action; then OPACS (Office of Price Administration and Civilian Supply), which took over on April 11; then OPA (Office of Price Administration) which took over on August 28.

Action up to April 3 took the form of schedules prescribing maximum prices for second-hand machine tools, for aluminum scrap and for zinc scrap, and an informal agreement with producers of scrap, including eastern railroads, to hold down the prices of No. 1 heavy melting steel to $20 a ton at Pittsburgh and to preserve customary differences in the prices of other grades,—an arrangement which was soon revised to allow $1 a ton more for

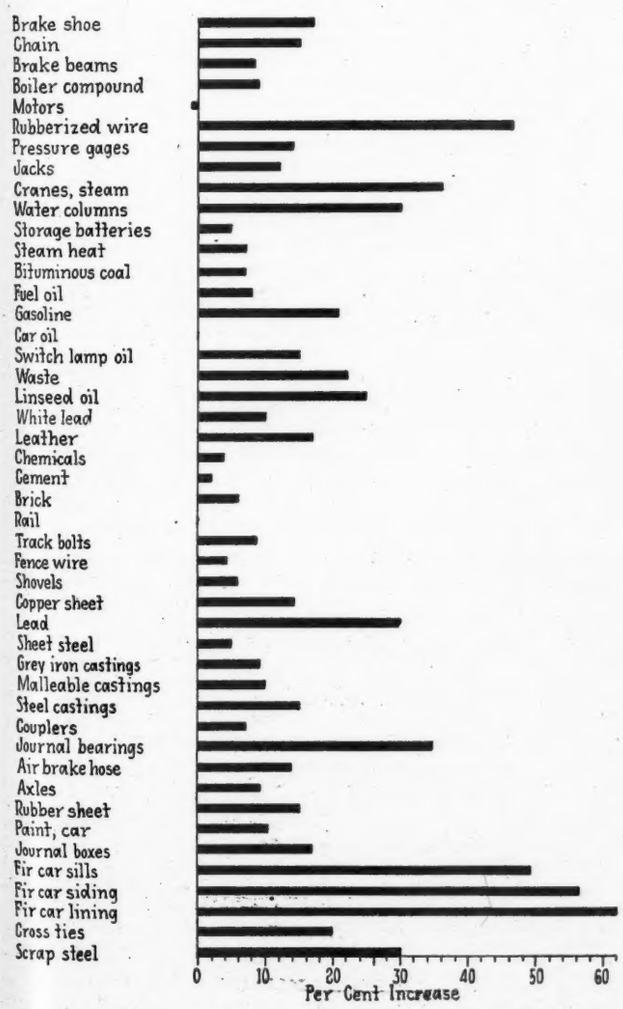
A. A. R. Average Prices for Repairs to Foreign Cars, Exclusive of Stores Expense

	Unit Prices Oct. 1941	Index Values—Based on October, 1938				
		Oct. 1941	Mar. 1941	Oct. 1940	Mar. 1940	Oct. 1939
Pipe couplings 1¼ ea.	$.098	122	102	99	104	105
Pipe nipples 1¼x10 ea.	.106	108	89	89	90	97
Pipe unions 1¼ ground ea.	.417	135	112	105	111	113
Pipe 1¼ ft.	.111	108	103	100	102	98
Bolts ¾x4½ lb.	.049	104	91	87	89	91
Bolts 1¼x17 ea.	.344	110	98	96	97	99
Bolts car ½x3 lb.	.016	94	88	98	99	98
Nuts sq. ⅞ lb.	.020	125	112	101	101	101
Bar iron, com. lb.	.041	178	165	156	173	147
Bar steel, carbon lb.	.023	95	95	96	100	96
Brake hangers lb.	.082	109	112	115	110	115
Center plates lb.	.058	109	105	102	104	104
Brake shoes, 1935 std. ea.	.598	117	113	110	106	104
Castings, grey iron lb.	.049	108	102	100	100	100
Castings, mall. lb.	.080	105	94	92	93	90
Castings, steel, to 100 lb.	.105	115	102	100	101	100
Castings, steel, over 100 lb.	.084	101	93	90	92	91
Chain ½—7/16 lb.	.078	114	107	106	104	101
Couplers E 5x7 ea.	28.581	108	96	97	96	99
Couplers E 6¼x8 ea.	30.804	108	96	96	96	99
Galv. steel 24 g. lb.	.037	97	97	97	97	97
Journal box 9" ea.	8.54	118	102	102	101	100
Journal box 10" ea.	9.75	119	103	103	101	101
Lag screws 100	1.809	110	97	95	98	100
Nails cwt.	2.788	101	101	97	98	94
Springs elliptical lb.	.070	102	100	102	103	100
Springs helical lb.	.054	105	103	104	104	105
Structural steel lb.	.023	100	98	100	100	100
Steel plate carb. lb.	.023	104	104	104	105	104
Steel plate H. T. lb.	.0347	93	93	95	95	98
Steel plate copper lb.	.024	104	104	100	104	100
Wheels, C. I. 33" cwt.	2.079	115	111	110	103	107
Wheels, W. S. 33" heavy ea.	33.829	101	100	101	100	100
Wheels, W. S. 50 T light ea.	19.85	117	117	112	109	108
Wheels, W. S. 70 T light ea.	21.64	116	116	112	107	107
Axles cwt.	3.794	101	102	102	103	103
Brake beams No. 15 ea.	6.063	104	97	98	99	98
Draft gear set	40.70	111	106	99	99	99
Journal brass lb.	.145	122	105	102	100	100
Paint, car gal.	.959	118	111	110	111	108
Rubber belt 5" 5 ply ft.	.399	97	97	97	97	97
Elec. bulbs 50 w. ea.	.221	97	101	102	104	101
Lubrication, pass. car. gal.	..179	104	101	101	104	102
Lumber, heavy M. ft.	50.413	130	117	115	108	113
Lumber, light M. ft.	61.005	159	139	131	116	123

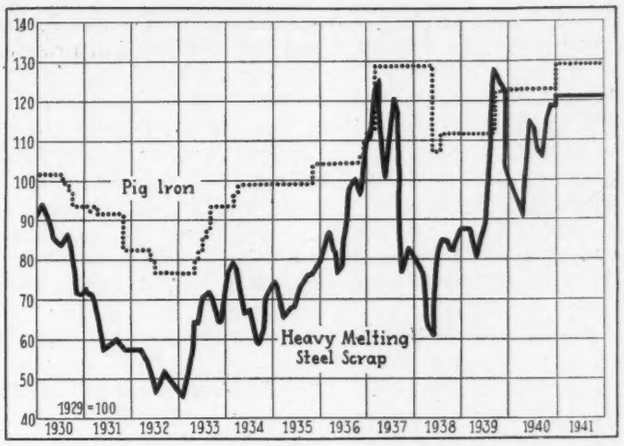
melting steel of railroad grade. This action proved insufficient to curb speculation, however. Scrap prices had begun to soar and force increases in the cost of materials made from it.

A detailed schedule was issued on April 3, prescribing the maximum permissible prices at which six grades of railroad scrap could be sold and delivered in 13 cities; requiring railroads to apply to OPA for the permissible prices at which unlisted grades could be sold in the same or other cities; fixing dealer's commissions, and requiring consumers to keep detailed records of purchases. Again on June 18, as scrap became more scarce, changes were made to allow $1 a ton over prescribed prices to cover additional transportation on semi-remote scrap, also to permit mills under certain conditions to pay even more to bring in remote scrap, also to revise the method of figuring prices on scrap from railroads not operating through published basing points, also to relieve regulations covering switching charges on railroad scrap, to give regular buyers first call on scrap sold off-line and to reserve all re-rolling rail for shipment only to re-rolling mills. No. 1 railroad melt prices varied from $15.50 delivered to consumers plants at San Francisco to $21 delivered to consumers plants at Pittsburgh, and railroads could sell scrap anywhere on their line at the highest prescribed price for any basing point on their line, which gave some railroads an advantage over other roads in selling scrap in the same cities.

Other revisions made on August 8 allowed Gulf ports the same ceiling prices as Eastern ports for exports (rail-



Increases in the Cost of Selected Materials Since August 1939



Month-to-Month Trend in Costs of Raw Materials for Railroad Steel

road scrap still moves to Europe) and additional basing points were added, the effect of which was to allow higher delivered prices for certain consumers who were being placed at a disadvantage in obtaining scrap. But scrap, though placed in a straight jacket, was becoming more unmanageable with growing shortages and with buyers

Maximum Prices for Railroad Scrap* Prescribed by OPM

Basing Points	GRADES	No. 1 Railway Grade Heavy Melting Steel	Scrap Rails	Rails for Rerolling†	Scrap Rails 3 Ft. and Under	Scrap Rails 2 Ft. and Under	Scrap Rails 18 In. and Under
Pittsburgh, Pa.		$21.00	$22.00	$23.50	$24.00	$24.25	$24.50
Wheeling, W. Va.		21.00	22.00	23.50	24.00	24.25	24.50
Steubenville, Ohio		21.00	22.00	23.50	24.00	24.25	24.50
Youngstown, Ohio		21.00	22.00	23.50	24.00	24.25	24.50
Sharon, Pa.		21.00	22.00	23.50	24.00	24.25	24.50
Canton, Ohio		21.00	22.00	23.50	24.00	24.25	24.50
Cincinnati, Ohio		20.50	21.50	23.00	23.50	23.75	24.00
Chicago, Ill.		19.75	20.75	22.25	22.75	23.00	23.25
Kokomo, Ind.		19.25	20.25	21.75	22.25	22.50	22.75
Philadelphia, Pa.		19.75	20.75	22.25	22.75	23.00	23.25
Wilmington, Del.		19.75	20.75	22.25	22.75	23.00	23.25
Sparrows Point, Md.		19.75	20.75	22.25	22.75	23.00	23.25
Cleveland, Ohio		20.50	21.50	23.00	23.50	23.75	24.00
Buffalo, N. Y.		20.25	21.25	22.75	23.25	23.50	23.75
Portsmouth, Ohio		20.50	21.50	23.00	23.50	23.75	24.00
Middletown, Ohio		20.50	21.50	23.00	23.50	23.75	24.00
Ashland, Ky.		20.50	21.50	23.00	23.50	23.75	24.00
St. Louis, Mo.		18.50	19.50	21.00	21.50	21.75	22.00
Kansas City, Mo.		17.00	18.00	19.50	20.00	20.25	20.50
Detroit, Mich.		18.85	19.85	21.35	21.85	22.10	22.35
Duluth, Minn.		19.00	20.00	21.50	22.00	22.25	22.50
Birmingham, Ala.		18.00	19.00	20.50	21.00	21.25	21.50
Los Angeles, Calif.		15.50	16.50	18.00	18.50	18.75	19.00
San Francisco, Calif.		15.50	16.50	18.00	18.50	18.75	19.00
Seattle, Wash.		15.50	16.50	18.00	18.50	18.75	19.00

* Delivered to consumers located on the line of railroad from which scrap originated.
†Re-laying quality $5.00 higher.

for export bidding against buyers for home consumption, and widely ignoring price ceilings. This brought scrap under priority rules, and action putting re-rolling rail prices on a shipping point basis and permitting re-rolling mills to pay any freight necessary to obtain it. Subsequently, relaying rail from Class I railroads was given a uniform price of $28 a ton f. o. b. shipping point and price barriers were largely removed in 9 western states to permit mills to bring in remote scrap.

Still further regulations became effective December 23. All iron and steel scrap other than scrap produced only by railroads was reshuffled according to its use and prices were established for each type of consumer instead of for each kind of scrap and differences between the prices

for different grades in the same class of scrap in the same area were largely wiped out. A uniform price of $20 was prescribed for six leading grades of open hearth scrap at Pittsburgh and 12 other points in the East and $16 can be paid at Pittsburgh for four leading grades of blast furnace scrap. Regional prices replace basing point prices for cast iron scrap and the price in each region is a shipping point price instead of a delivered price.

Ceilings were placed on copper scrap on August 19 and on prices of second-hand steel drums on November 25, and revisions were also made in the ceilings established on the prices of aluminum and lead scrap. Meanwhile, the Government had succeeded in exposing some of the violators of price regulations in the scrap field and forcing them to refund money improperly received.

Steel Prices Stable

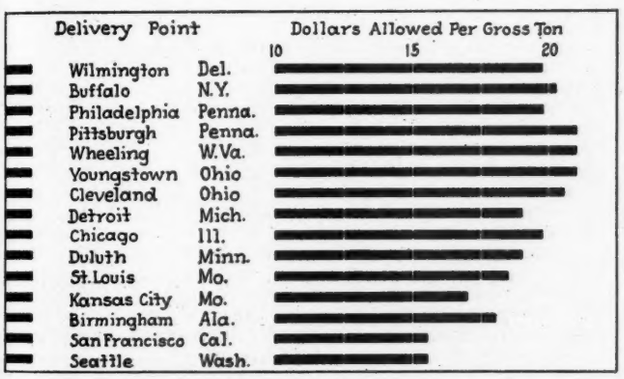
From the standpoint of prices, steel was the most stable of the materials affected by the defense program last year and less formal action was taken by the Govern-

Average Cost of Fuel Consumed — 10 Months 1941

	Coal		Fuel Oil	Gaso.	Diesel
	Less Frt. Per Ton, Dollars	With Frt. Per Ton, Dollars	Per Bbl., Dollars	Per Gal., Cents	Per Gal., Cents
LINE HAUL CARRIERS					
Akron, Canton & Young	2.15	3.50	2.92	15.14	...
Ala. Great Southern	2.54	2.59	...	18.00	4.62
Alton	2.12	2.31	1.71	6.80	4.49
Ann Arbor	1.91	3.84	1.78	11.07	6.44
Atch. Top. & Santa Fe	2.79	2.95	.86	6.18	3.95
Atlanta & West Point	2.35	3.58	...	...	...
Atlanta, Birm. & Coast	2.35	2.92	...	...	...
Atlantic Coast Line	2.03	3.49	...	...	4.66
Baltimore & Ohio	1.98	2.10	1.66	9.15	4.59
Bangor & Aroostook	...	5.49	...	...	...
Bessemer & Lake Erie	2.31	2.52	2.13	12.44	8.50
Boston & Albany	1.82	4.79	...	...	4.58
Boston & Maine	2.13	4.87	1.98	12.27	5.27
Burlington-Rock Island	...	...	.80	.06	.04
Cambria & Indiana	2.21	...	...	...	...
Canadian National in N. E.	1.99	3.75	4.00	14.55	...
Canadian Pacific in Vt.	2.32	5.97	...	16.91	...
Central of Georgia	2.53	2.62	1.35	7.73	4.81
Central of New Jersey	2.17	3.91	1.89	12.51	4.62
Central Vermont	1.92	5.15	2.12	.13	...
Char. & Western Carol.	2.09	3.66	...	...	...
Chesapeake & Ohio	2.28	2.34	1.58	6.00	...
Chicago & Eastern Ill.	1.91	2.02	1.47	9.23	4.60
Chicago & Ill. Midland	1.74	1.95	2.14	12.19	...
Chicago & North Western	1.45	1.87	.65	8.40	5.04
Chicago, Burl. & Quincy	1.70	1.83	.65	6.15	3.83
Chicago Great Western	1.52	2.42	1.05	6.74	4.33
Chicago, Ind. & Louisville	1.86	2.00	1.98	...	...
Chicago, Mil. S. P. & Pac.	2.04	2.30	.94	6.76	4.20
Chicago, R. I. & Pac.	1.83	2.16	.66	9.75	4.02
Chicago, St. P., Minn. & Om.	1.45	4.33	1.21	7.45	3.81
Cin., New Orleans & Tex. Pac.	2.15	2.52	...	...	5.26
Clinchfield	2.14	2.21	2.01	7.25	...
Colorado & Southern	2.75	2.88	.58	6.77	5.52
Colorado & Wyoming	3.06	4.43	...	.13	...
Columbus & Greenville	1.68	2.93	...	7.28	...
Delaware & Hudson	2.16	3.94	1.57	...	...
Delaware, Lack. & Western	2.22	3.70	1.98	...	4.62
Denver & Rio Grande Western	2.13	2.18	2.30	11.61	5.87
Denver & Salt Lake	1.67	1.67	...	7.59	5.92
Detroit & Mackinac	2.01	4.68	1.21	.07	...
Detroit & Toledo Shore	1.96	3.71	2.83	...	...
Detroit, Toledo & Ironton	2.15	3.07	1.99	14.67	5.52
Duluth, Miss. & Iron Range	2.60	4.73	2.63	9.89	...
Duluth, S. S. & Atlantic	...	4.75	1.83	14.73	...
Duluth, Winnipeg & Pac.	...	4.63	3.43	15.22	...
Elgin, Joliet & Eastern	1.98	2.13	1.98	11.34	4.92
Erie	2.21	2.77	1.92	8.03	4.75
Florida East Coast	...	...	1.17	...	4.47
Fort Worth & Denver City	2.66	5.40	.61	5.80	3.97
Georgia	2.03	3.90	...	18.17	...
Georgia & Florida	2.05	3.95	2.00	19.72	...
Ga. Southern & Florida	2.09	4.08	...	17.10	4.31
Grand Trunk Western	1.63	3.37	1.65	13.21	6.31
Great Northern	1.33	3.33	.80	7.01	4.12
Green Bay & Western	...	4.44	...	...	5.94
Gulf & Ship Island	1.55	3.65	1.58	11.85	...
Gulf Coast & Subsidiaries	...	...	.80	8.40	3.87
Gulf, Mobile & Ohio	1.74	2.12	...	7.21	4.34
Illinois Central	1.89	2.20	1.47	12.64	4.60
Illinois Terminal	1.94	2.10	1.55	14.25	7.66
International-Great. Nor.	...	...	.76	...	3.89
International of Maine	1.97	5.61	...	16.58	...
Kansas City Southern	2.07	2.38	.75	...	4.10
Kansas, Okla. & Gulf	2.52	2.94	1.63	11.14	...
Lake Superior & Ishpeming	...	4.97	...	...	...
Lehigh & Hudson River	1.83	4.56	...	11.70	...
Lehigh & New England	2.01	3.66	1.89	14.54	...
Lehigh Valley	2.08	3.97	2.00	8.00	4.68
Long Island	2.23	4.80	1.42	11.38	4.89
Louisiana & Arkansas	2.09	...	.71	16.86	3.72
Louisville & Nashville	1.98	2.10	1.66	17.06	3.99
Maine Central	3.76	5.16	1.98	13.73	5.41
Midland Valley	2.41	2.58	1.52	10.85	...
Minneapolis & St. Louis	1.89	2.10	1.44	6.91	4.45
Minn., St. P. & S. S. M.	1.46	3.78	1.67	8.44	5.42
Mississippi Central	1.49	3.51	...	12.23	...
Missouri & Arkansas	2.11	2.73	...	7.10	1.96
Missouri-Illinois	1.80	1.87	...	6.63	...
Missouri-Kans-Tex	2.39	2.95	.72	5.88	...
Missouri Pacific	1.88	1.95	.67	5.07	3.52
Monongahela	1.91	2.01	2.85	15.44	...
Montour	2.19	2.19	...	...	...
Nashville, Chat. & St. L.	2.09	2.52	1.22	6.20	3.25
Nevada Northern	2.46	5.24	...	19.69	...
New Orleans & N. E.	2.39	3.60	1.48	17.31	4.50
New York Central	2.00	2.28	1.41	10.68	5.08
New York, Chicago & St. L.	2.13	3.62	1.95	...	...
New York Connecting	...	...	1.36	...	...
New York, New Haven & Hart.	2.07	4.39	1.37	11.29	5.12
New York, Ont. & Western	2.16	3.99	...	...	...
Norfolk & Western	2.04	2.09	1.58	6.24	...
Norfolk Southern	2.03	3.89	...	9.14	...
Northern Pacific	1.58	2.07	.92	9.52	4.82
Northwestern Pacific	2.75	...	.82	7.76	4.88
Oklahoma City-Ada-Atoka	...	3.42	1.50	...	...
Pennsylvania	2.05	2.21	1.76	12.46	4.71
Penn.-Reading Seashore	2.07	4.84	1.31	11.56	...
New York, Susq. & Western	2.14	4.62	...	9.31	4.59
Pere Marquette	2.08	4.12	1.84	9.76	6.72
Pittsburgh & Lake Erie	2.04	2.31	2.31	14.83	...
Pittsburg & Shawmut	2.09	2.17	3.52	14.81	...
Pittsburgh & West Virginia	2.12	2.14	...	...	...
Pitts. Shawmut & Northern	2.26	2.25	...	...	...
Reading	2.02	3.45	2.02	12.08	...
Richmond, Fred. & Potomac	1.93	4.40	...	9.81	4.74
Rutland	2.03	4.77	2.13	...	...
St. Louis-San Francisco	2.05	2.13	.72	9.98	...
St. Louis-San Francisco & Tex.	...	...	.73	10.17	...
St. Louis Southwestern	1.95	2.74	.74	7.08	...
Seaboard Air Line	2.09	3.32	1.36	11.96	4.82
Southern	1.99	2.14	1.64	17.59	4.55
Southern Pac.-Pac. Sys.	3.15	3.41	1.01	11.14	4.41
Spokane International	2.70	3.92	...	...	...
Spokane, Port. & Seattle	4.90	...	.88	14.96	4.18
Staten Isl. Rapid Transit	2.25	4.83	...	...	...
Tennessee Central	1.94	2.12	2.43	...	6.74
Texas & New Orleans	2.66	...	.78	7.47	3.89
Texas & Pacific	...	...	.76	...	...
Texas Mexican	...	...	...	...	3.08
Toledo, Peoria & Western	1.75	1.82	3.04	16.62	8.60
Union Pacific	2.07	2.19	1.16	8.55	4.24
Utah	1.84	1.97	2.50	15.73	...
Virginian	2.08	2.39	...	...	...
Wabash	1.91	2.28	1.74	7.65	4.33
Western Maryland	2.12	2.29	2.02	11.04	7.14
Western Pacific	2.23	3.46	.82	9.84	5.18
Wheeling & Lake Erie	2.16	2.28	2.04	12.01	5.05
SWITCHING AND TERMINAL COMPANIES					
Aliquippa & Southern	...	2.79	...	...	...
Alton & Southern	1.65	2.38	...	...	...
Baltimore & Ohio C. T.	2.00	...	...	...	...
Belt of Chicago	1.70	3.14	3.66	.11	.05
Birmingham Southern	...	...	...	...	3.72
Brooklyn Eastern	...	...	1.30	...	...
Chicago & Western Indiana	1.56	3.15	2.00	.13	...
Chicago River & Indiana	1.53	3.19	...	...	4.93
Cincinnati Union Terminal	2.00	3.88	...	...	...
Conemaugh & Black Lick	2.57	2.57	...	...	...
Detroit Terminal	2.00	4.11	...	15.46	...
Houston Belt & Terminal	...	...	.83	...	.04
Indiana Harbor Belt	1.62	3.23	1.97	...	...
Indianapolis Union	1.85	3.09	2.06	...	...
Kansas City Terminal	1.69	3.67	.89	...	.04
Kentucky & Indiana Terminal	1.82	3.18	...	...	...
Lake Terminal	2.20	3.75	...	14.16	...
Minnesota Transfer	...	6.08	...	...	6.55
Monongahela Connecting	3.97	4.01	...	...	5.57
New Orleans Terminal	2.35	4.72	...	...	...
Newburg & South Shore	2.04	3.53	...	12.14	5.46
Northern Pac. Term. of Ore.	...	...	.93	...	.05
Ogden Union	2.22	4.20	.69	17.53	...
Peoria & Pekin Union	2.05	2.39	3.10	15.97	5.07
Portland Terminal	4.75	5.10	2.21	13.90	4.89
St. Paul Union Depot	...	6.54	...	8.72	6.31
Terminal of St. Louis	2.45	3.20	3.63	...	.05
Terminal of New Orleans	2.05	...	.84	.18	.05
Toledo Terminal	...	3.96	...	...	...
Union of Penna.	2.63	2.69	2.85	...	5.83
Washington Terminal	2.18	4.72	...	...	...

ment to keep prices in check. This is contrasted with the rigid controls which were placed over its production and distribution and was partly the result of the attention given to controlling the prices of raw materials, and the unprecedentedly high rate of production in which to absorb increased costs and also the concentration of authority over policies. However, while most basic prices were unchanged, many prices were indirectly increased to the railroads by increased costs of procurement, as where delayed deliveries forced railroads to accept smaller lots at the higher prices charged for smaller lots, or obtain their needs from brokers at even higher prices, and it is noteworthy that most orders are now being accepted by mills subject to prices at the time of shipment. Railroads also obtain much iron and steel from small producers and from specialty makers who could not as easily absorb the higher costs of raw materials and labor as the larger producers, and felt compelled to add at least a portion of these costs to the prices of their materials.

Makers of steel products, therefore, did not escape the attention of OPA. In August, 225 steel companies were requested to furnish cost data and by September 19 price ceilings had been placed on pig iron and items of finished and semi-finished steel. On September 25, new prices were applied to second-hand machine tools, dealers



Top Prices for Heavy Melting Steel Sold by Railroads—Showing Difference in Prices Allowed at Different Basing Points

in which had been charged with inexcusable profiteering. On November 13, OPA stated that the prices of forgings for locomotives and other heavy machinery had been increased substantially and not only requested producers not to exceed the prices prevailing on October 10, but also called a meeting to discuss the long range price problem. Three days later, an order was issued fixing maximum prices for steel castings, including couplers, yokes and other railroad specialties, at the levels of prices in existence on July 15, and announcing that application must be made to OPA in the future for proposed deviations from these schedules. Four days later, following a meeting on November 18, manufacturers of railroad freight and passenger cars, locomotives and maintenance of way and signal equipment were requested not to increase their prices above the levels in effect on October 1, pending a detailed study by OPA of railway materials and equipment, and a further meeting was held on November 25 when builders of locomotives and locomotive specialties were requested to co-operate with OPA in stabilizing prices and formulating the most effective methods for doing it.

In addition to these and other efforts of the Government to regulate material and equipment prices, regulations were issued on December 15, reducing to the levels of April 16 prices for iron and steel products sold by jobbers, dealers and distributors, who were known to have increased their prices from 50 to 200 per cent.

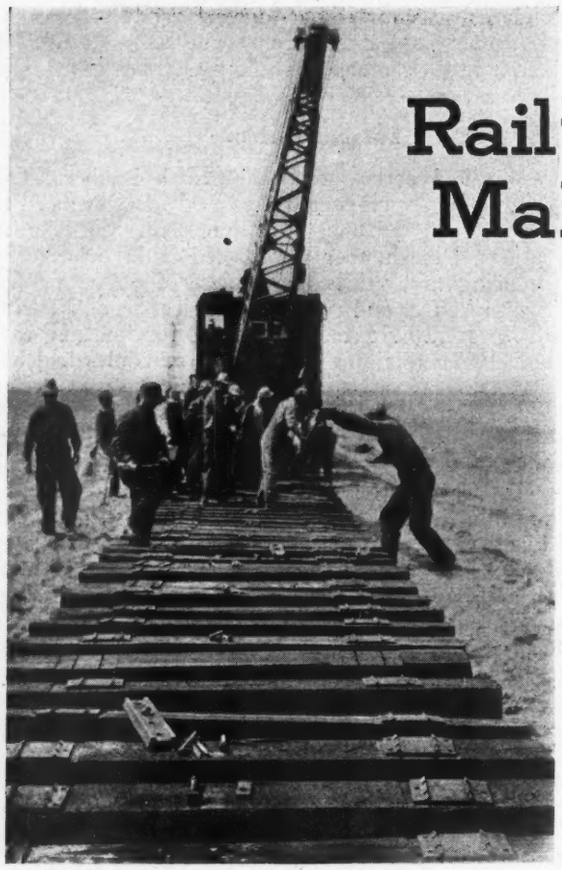
Lumber Problem

More detailed action was taken with lumber. On August 1, ceiling prices were prescribed for Douglas Fir plywood, following advances of 20 per cent. On August 16, Southern Pine lumber was placed under price ceilings, reducing mill prices an average of $3 under the levels then in effect and prescribing prices in detail with a view to preventing excessive charges for finishing and dressing, OPA explaining that formal schedules had become necessary because of unjustified increases in prices and the indifference to repeated warnings from the Government not to increase prices. Revisions were made on September 4, raising some ceilings to permit small mills to meet the higher costs of stumpage and allowing additions for kiln drying, but maintaining top prices under those in effect previous to August 15. One week later maximum prices were prescribed for Douglas Fir lumber, maintaining prices of common grades at existing levels and reducing prices on upper grades an average of $10 a thousand board feet. Flooring was reduced from $75 to $60, drop siding from $60 to $50, ceiling from 55 to $45. Southern Pine lumber schedules were further revised on November 19 to bring freight car lumber under a ceiling, reducing prices from $2 to $8 a thousand board feet below the existing levels. Objections to the workability of the schedules for Southern Pine and the fact that both Southern Pine and Douglas Fir lumber were then selling below the maximum prices prescribed in the schedules caused the postponement of meetings to establish similar ceilings on Douglas Fir car lumber pending a re-discussion of the subject of railroad lumber prices by the producers and the Government.

More Laws in Sight

Thus, in the short space of a year prices of most of the more important materials, supplies and equipment purchased by railroads have been brought under control of the Government, either by informal agreements with manufacturers not to advance prices or by requests on manufacturers not to increase prices above levels in effect on specific dates or to change selling practices in such a way as to circumvent these agreements or by detailed schedules formally fixing prices of specific commodities and providing for detailed information on sales, profits and inventory with which to police the price regulations. Moreover, legislation is now before Congress, the purpose of which is to broaden the scope of the price regulations still more and to reinforce the power of the defense agencies to enforce their rulings and punish violators, all for the avowed purpose of preventing the recurrence of the ruinous prices of the last war.

While the measures taken thus far have restrained prices, OPA frankly admits that price ceilings cannot be made without regard to labor and other costs which enter into the production and distribution of materials. As matters now stand, the pressure to increase prices is strong and shows every sign of increasing as the requirements for war bring greater strain on the producing capacity of the country. At this moment, for example, crossties are in great demand and it is out of the question to produce them in most sections of the country without paying wages more nearly comparable to those paid in the defense industries where thousands of persons who previously cut ties are now employed.



Fifty-Four Miles of New Lines Were Completed in 1941

Railway Construction Makes Further Gains

Increases shown as improved business and defense requirements demand speedy and dependable movement of traffic

By George E. Boyd
Associate Editor

AS was predicted at the beginning of the year, there was a sharp increase in railway construction during 1941. As traffic increased to an all-time record in revenue ton-miles, and as earnings increased likewise, this prediction was fulfilled, for construction activity became greater than for any year in the last decade. While the economic, political and civilian dislocations that are now occurring with such rapidity make it unsafe to predict events very far in advance, all present signs point to a continuation of traffic at its present high level and to still greater activity in railway construction in 1942, primarily to expand facilities that are needed to expedite traffic.

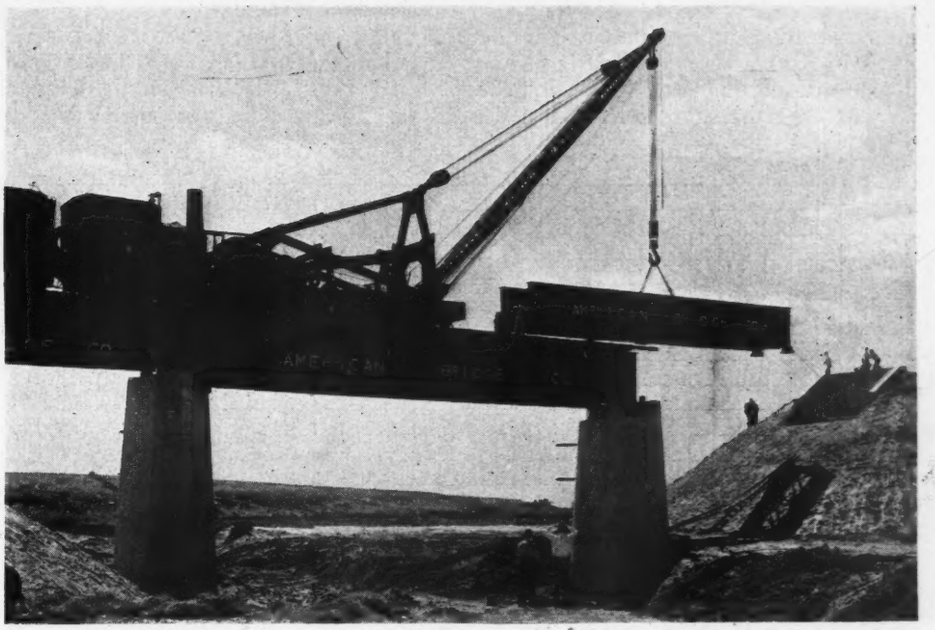
Since the completion of the construction projects that were under way when the disaster of 1929 overtook the country, no general and very little local expansion of the railway plant has occurred, and likewise practically no construction of consequence in the way of internal improvements has been undertaken. While there were several reasons for this situation, the primary one was that earnings remained consistently at so low a level that, with only a few exceptions, it has been impracticable to finance projects of any magnitude. Of only slightly less weight, during this period economic conditions have been so disturbed and uncertain that there has been little incentive to make commitments for a future that no one could foresee.

Yet, during this same period, the requirements of operation and of traffic have changed more radically than during any similar period in railway history. So completely have the methods of operation changed and so insistent are the demands for faster service, that not a few of the facilities that were the latest word in design and operating characteristics as recently as 10 or 15 years ago are outmoded today, and many of those that were constructed earlier are seriously out of date. It follows that, with the largest traffic the railways have ever been called on to handle and with the need for expediting its movement, many of the older as well as the more recent facilities should be replaced with others that are designed to make the newer methods of operation fully effective.

While the railways are doing a splendid job in moving this record-breaking volume of business, they are working under a handicap which is steadily becoming more burdensome by reason of the growing practice of operating freight trains at high speeds to insure earlier delivery of merchandise at distant points. In addition to these considerations, it is obvious that in not a few instances, the absence of modern facilities is hampering the development of still other methods that will improve the handling of trains and thus make possible even greater dispatch in the movement of other commodities, or is preventing more economical operation. Again, it cannot be ignored that the inability to carry out needed improvements has made it impossible for some roads to meet competition effectively.

Miles of Main Track Built in 1941

United States	Number of companies building	First track	Second track	Third track	Fourth track	Total
Alabama	1	1.54				1.54
California	1				0.31	0.31
Illinois	2	2.31	2.81			5.12
Kentucky	1	9.85				9.85
Louisiana	1		0.16			0.16
Maine	1	0.15				0.15
New York	1	0.15			1.23	1.38
Oregon	1		1.35			1.35
Virginia	2		3.97			3.97
Washington	1	36.07				36.07
West Virginia	2	4.00		2.22		6.22
Total		54.07	8.29	2.22	1.54	66.12



More Heavy Construction Was Under Way in 1941 Than in Any Year Since 1930

Even under the most favorable circumstances, railway facilities suffer from a high rate of obsolescence, but because of a decade of practical suspension of construction activity and as a result of the radical changes that have occurred in operating methods, more railway facilities are obsolete today than at any previous time. When the added demands that are being imposed on these facilities by the increased volume of business are considered, it becomes clear that there is a need for a vast program of construction and reconstruction that will affect practically every type of railway facility and that will overshadow all former programs.

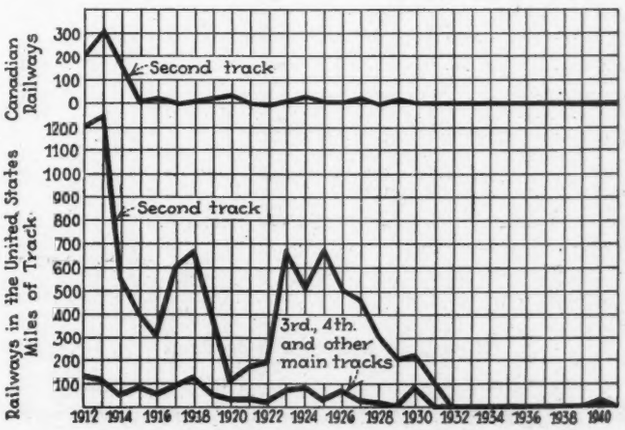
There are ample indications that traffic will remain at its present level or increase as further defense projects get under way and defense production increases. With earnings equal to or greater than those for the year that has just closed, and in view of the pressing need for more modern facilities for handling expeditiously the traffic that must be moved, the prospect is that there will be a further increase in the number of more important projects undertaken, as there has already been in those of smaller magnitude. In other words, with traffic continuing at its present level or increasing, construction activity will increase, for there is now a larger suppressed need for a vast and widespread program of improvements than has ever before been experienced.

Miles of New Lines Completed in the United States Since 1830

Year	Miles	Year	Miles
1830	40	1886	8,400
1831	99	1887	13,081
1832	191	1888	7,066
1833	116	1889	5,707
1834	214	1890	5,739
1835	138	1891	4,620
1836	280	1892	4,648
1837	348	1893	3,024
1838	453	1894	1,760
1839	386	1895	1,420
1840	491	1896	1,692
1841	606	1897	2,109
1842	505	1898	3,265
1843	288	1899	4,569
1844	180	1900	4,894
1845	277	1901	5,368
1846	333	1902	6,026
1847	263	1903	5,652
1848	1,056	1904	3,832
1849	1,048	1905	4,388
1850	1,261	1906	5,623
1851	1,274	1907	5,212
1852	2,288	1908	3,214
1853	2,170	1909	3,748
1854	3,442	1910	4,122
1855	2,453	1911	3,066
1856	1,471	1912	2,997
1857	2,077	1913	3,071
1858	1,966	1914	1,532
1859	1,707	1915	933
1860	1,500	1916	1,098
1861	1,016	1917	979
1862	720	1918	721
1863	574	1919	686
1864	947	1920	314
1865	819	1921	475
1866	1,404	1922	324
1867	2,541	1923	427
1868	2,468	1924	579
1869	4,103	1925	644
1870	5,658	1926	1,005
1871	6,660	1927	779
1872	7,439	1928	1,025
1873	5,217	1929	666
1874	2,584	1930	513
1875	1,606	1931	748
1876	2,575	1932	163
1877	2,280	1933	24
1878	2,428	1934	76
1879	5,006	1935	45
1880	6,876	1936	93
1881	9,789	1937	148
1882	11,599	1938	38
1883	6,819	1939	58
1884	3,974	1940	26
1885	3,131	1941	54

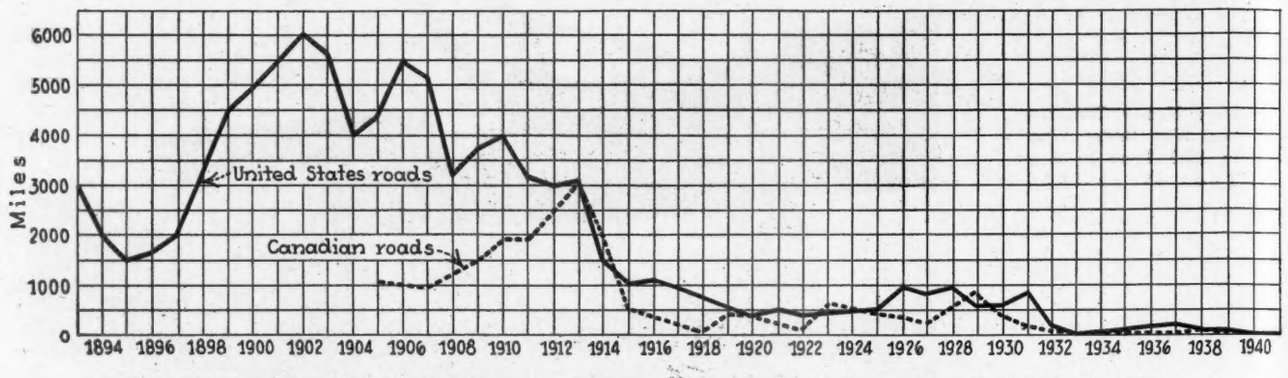
Marked Increase in Construction

During 1941 there was a marked increase in construction projects of every kind. In the railway field these projects fall into two groups regardless of other classifica-



Only 12 Miles of Multiple Tracks Were Completed in 1941

cations—those that can be paid for out of current revenues, and those of greater magnitude that must be financed with borrowed funds. Reports from all sources indicate that more projects in the first group were undertaken in 1941 than for more than a decade, that there was also a considerable increase in the larger projects and that the expenditures for new and improved facilities will be greater than for any year since 1930. However, this increase is reflected to only a limited extent in the tabulation that follows this article, since it includes only those projects, except grade-crossing eliminations that cost approximately $100,000 or more.



New Lines Constructed in the United States in 1941 Aggregated 54 Miles. Canada Completed Only One Mile

For many years the railways had engaged extensively in the elimination of grade crossings, mainly at their own expense. Beginning with 1936, however, an unprecedented amount of grade-separation work has been carried out in all sections of the country, primarily with federal funds granted to states and municipalities for this purpose. As the original federal appropriations, amounting to $200,000,000, were exhausted, this type of construction fell off rapidly, as the larger projects were completed during 1937. Immediately succeeding this, appropriations were smaller and most of the projects were of a magnitude that could be finished in the year in which they were undertaken. Today, the projects are being selected on the basis of maximum benefits, so that while the number is somewhat smaller, the average cost of the individual projects is somewhat greater than formerly, although not a few low-cost projects are included.

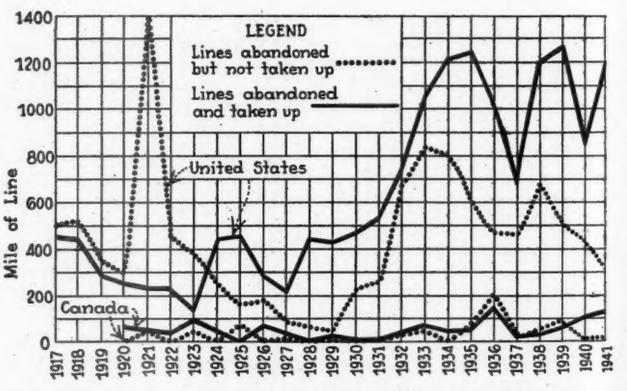
Miles of New Lines Completed in Canada Since 1904

Year	Miles	Year	Miles
1904	316	1923	655
1905	1,181	1924	615
1906	1,007	1925	414
1907	976	1926	335
1908	1,249	1927	310
1909	1,488	1928	723
1910	1,844	1929	841
1911	1,898	1930	385
1912	2,232	1931	250
1913	3,013	1932	121
1914	1,978	1933	0
1915	718	1934	1
1916	290	1935	2
1917	207	1936	1
1918	135	1937	0
1919	433	1938	101
1920	305	1939	1
1921	252	1940	2
1922	145	1941	1

New-Line Mileage Increases

It has been noted for many years that the mileage of new lines under construction or completed in any year provides an excellent index of railway construction activities as a whole, and this belief is borne out by analysis of construction records over a long period. Surprising as it may seem, this rule holds good during periods of reduced construction as well as during more active periods. Confirming this trend, 54 miles of new lines were completed during 1941, a total that, while insignificant when compared with the 11,599 miles completed in 1881 and the 13,081 miles completed in 1887, is more than double the 26 miles completed in 1940. It also compares with 38 miles in 1938 and with 24 miles in 1933, the latter being the smallest recorded since the first railway construction in 1830. It is of interest, however, that several new-line projects are now either in progress or under consideration, mainly in connection with line revision although the larger of these projects are being held in abeyance because of difficulties connected with financing them.

During the 20-year period ending with 1921, the mileage of new lines completed annually varied from 314 in 1920 to 6,026 in 1902, the former being the largest mileage recorded since 1888, which was during the period of feverish railway expansion, while the latter was the smallest mileage recorded up to that time since 1847—when the long period of railway expansion was beginning. During the 20-year period ending with 1941, the largest mileage completed in any year was in 1928, when 1,025 miles were placed in operation and the smallest was the 24 miles completed in 1933.



Abandonments in the United States Exceeded 1,000 Miles for the Eleventh Time. Those in Canada Aggregated 135 Miles

It is significant that the average mileage completed year by year during the earlier period was 2,884 miles while the average for the two decades just closed was only 372 miles. These figures provide the strongest possible evidence that the days of large external devel-

opments are past, and that future expenditures will be applied more and more for internal improvements and for expansion of those facilities that will expedite the movement of traffic.

Of the 54 miles of new lines placed in service during the year, 28 miles represented a relocation by the United States government to replace tracks of the Great Northern that had to be abandoned by reason of the construction of the Grand Coulee dam. Eight miles were also constructed by this road to reach the Sunset airport at Galena, Wash. Ten miles of a branch line in Kentucky was completed by the Chesapeake & Ohio, and during the year the Strouds Creek & Muddlety placed in service a 4-mile extension in West Virginia. Of the remainder, the largest single project involved 2.31 miles of double track which the Belt Railway of Chicago constructed as a substitute line to permit expansion of the Municipal airport.

In Canada the only project of any magnitude involved slightly less than one mile, which was built as a line revision along the Kaministiqua river, west of Kakabeka Falls, near Ft. William, Ont.

Multiple Track Mileage

There was a decrease in the construction of second-track mileage from 25.92 miles in 1940 to 8.29 miles in 1941. This latter total was made up of 3.44 miles completed by the Norfolk & Western at Petersburg, Va., to serve Camp Lee; by the relocation of the Belt Railway of Chicago around the Municipal airport, 2.31 miles; and by 1.35 miles completed by the Southern Pacific between Brooklyn, Ore., and East Portland; the remainder being made up of small amounts, mostly in connection with other work.

In 1940 no third or fourth track was completed by any road in the United States. Last year, however, the Norfolk & Western constructed 2.22 miles of third track between Iaeger, W. Va., and Hall, and the New York Central extended its fourth track 1.23 miles at Dunkirk, N. Y., in connection with a track elevation project that has been underway during the year. During the year there have been a number of installations of centralized traffic control and several others are still in progress, some of which are making the construction of multiple tracks unnecessary.

A type of new-track construction that first made its appearance in 1940 was again in evidence during 1941, and a number of projects had been completed or were still under construction as the year closed. These are tracks being built to serve munition plants, training camps, military and ordnance depots, air fields and fortified areas. In some instances the railways from which these military lines branch have built the new tracks; in others they have built only to the property line of the reservation, and in still others the entire construction has been undertaken by the army or the navy. It is also expected that, in view of our entry into the war, that there will be a considerable expansion of this construction during 1942. A more detailed discussion of this subject appears in a separate article on another page of this issue.

Miscellaneous Construction

Among the larger projects completed or still under construction at the end of the year, the Boston & Maine tracks are being relocated around the Birch Hill flood-control dam at Royalston, Mass.; the Chesapeake & Ohio has under way a line and grade revision, includ-

Mileage Abandoned 1932 to 1941, Inclusive

	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	Total
Alaska	....	18.27	....	....	....	3.00	195.20	....	....	....	216.47
Alabama	20.82	28.08	36.22	....	42.09	9.95	1.64	21.96	20.40	68.09	249.25
Arizona	....	126.51	15.49	17.04	....	....	16.00	8.49	8.73	0.92	193.18
Arkansas	8.17	37.85	51.28	42.35	23.95	83.43	51.10	5.59	51.39	53.01	408.12
California	0.77	185.65	116.00	70.57	30.57	74.23	34.27	37.71	148.72	36.32	734.81
Colorado	26.39	56.57	6.31	84.98	86.30	231.46	26.29	77.43	....	12.74	608.47
Connecticut	....	....	....	33.93	....	25.31	50.25	....	16.88	1.17	127.54
Delaware	....	....	....	....	33.16	....	3.07	....	0.88	....	37.11
Florida	70.09	69.59	28.13	1.47	165.22	....	12.00	40.91	....	52.81	440.22
Georgia	66.41	46.56	126.63	12.34	....	....	85.26	39.70	0.99	87.41	465.30
Idaho	15.41	....	4.63	46.78	16.00	....	....	84.52	....	11.60	178.94
Illinois	54.83	38.30	160.82	13.90	32.06	87.42	29.41	57.14	26.25	90.45	590.58
Indiana	14.80	25.66	....	69.70	0.12	....	....	....	5.23	....	115.51
Iowa	53.12	79.51	52.44	83.32	208.75	14.44	120.58	55.88	90.01	14.10	772.15
Kansas	....	128.97	162.64	236.85	51.33	21.04	....	50.73	....	99.47	751.03
Kentucky	78.17	74.27	22.89	7.86	....	12.81	14.58	2.74	18.00	95.98	327.30
Louisiana	45.35	35.94	37.48	8.96	6.50	11.46	60.67	28.22	71.42	....	306.00
Maine	8.50	13.95	71.39	8.16	....	35.97	12.84	....	....	15.92	166.73
Maryland	1.00	....	....	25.60	....	3.75	20.23	13.29	....	7.50	71.37
Massachusetts	1.40	....	....	33.37	....	33.26	21.82	67.52	51.48	3.08	211.93
Michigan	201.99	51.05	71.39	166.20	40.16	64.65	116.65	8.14	16.99	62.83	800.05
Minnesota	91.07	12.94	53.37	50.93	31.94	23.18	32.91	....	42.28	52.15	390.77
Mississippi	24.10	33.50	85.57	....	....	....	....	37.45	15.48	42.44	238.54
Missouri	53.17	25.51	202.65	118.98	48.47	....	91.48	256.51	59.11	58.57	914.45
Montana	3.80	....	....	18.37	10.31	29.28	....	41.73	....	3.52	107.01
Nebraska	15.21	45.39	4.87	....	....	....	14.66	44.29	46.50	18.76	189.68
Nevada	....	....	26.27	0.31	....	....	214.71	2.20	31.30	....	274.79
New Hampshire	25.46	....	5.90	63.92	28.61	16.99	28.40	12.18	2.45	....	183.91
New Jersey	....	62.58	21.38	....	60.57	6.32	1.14	3.46	18.84	19.27	193.56
New Mexico	....	....	41.10	48.02	....	....	....	18.76	....	118.79	226.67
New York	58.32	4.14	30.82	30.58	57.00	29.33	201.12	51.19	60.69	0.36	523.55
North Carolina	22.24	53.10	18.50	10.00	11.39	25.17	53.82	....	62.34	31.57	288.13
North Dakota	....	....	....	....	16.36	....	3.56	....	....	....	19.92
Ohio	35.43	17.81	....	18.77	66.47	24.08	3.16	26.04	3.95	11.73	207.44
Oklahoma	....	9.24	79.01	....	8.60	15.95	108.87	222.97	11.39	16.95	472.98
Oregon	25.92	12.31	7.75	13.00	133.17	....	0.15	17.01	20.40	28.99	258.70
Pennsylvania	29.75	39.33	77.60	58.64	105.37	33.58	86.63	65.94	51.34	41.49	589.67
Rhode Island	....	....	....	....	....	16.33	0.58	0.48	....	....	17.39
South Carolina	44.05	....	1.54	76.50	25.00	15.80	8.60	13.50	24.97	84.66	294.62
South Dakota	....	....	24.04	26.65	16.43	....	23.33	....	120.98	14.05	225.48
Tennessee	74.01	39.81	41.23	64.15	54.84	47.94	2.60	53.44	20.49	45.87	444.38
Texas	107.10	188.82	126.13	77.81	39.12	44.63	23.96	118.83	75.16	123.60	925.17
Utah	19.71	3.05	16.19	....	....	6.88	14.70	66.03	....	....	126.56
Vermont	....	33.22	....	....	1.00	8.75	26.38	3.87	....	....	73.22
Virginia	112.89	51.69	4.80	21.74	....	4.45	47.46	0.66	38.55	1.96	284.20
Washington	16.36	55.86	12.01	88.35	12.69	10.44	30.10	8.83	13.20	43.30	291.14
West Virginia	1.36	77.49	26.08	12.13	21.10	8.85	....	14.29	29.69	16.77	207.76
Wisconsin	24.90	93.14	124.45	39.65	38.18	59.47	6.78	103.40	22.80	20.62	533.39
Wyoming	....	....	....	41.07	....	....	....	....	....	....	41.07
Total	1,452.07	1,875.66	1,995.00	1,842.95	1,522.84	1,139.60	1,896.96	1,783.03	1,299.28	1,508.82	16,316.21

ing the construction of a new tunnel at the crest of the Blue Ridge mountains in Virginia; the Chicago, Rock Island & Pacific is improving its alinement and grade near Princeton, Mo.; a high-level crossing over the Morganza floodway is under construction by the Missouri Pacific lines at Krotz Springs, La.; the New York Central is revising its alinement and eliminating a number of grade crossings at Herkimer, N. Y., and is also completing a track elevation through Dunkirk, N. Y., while the Michigan Central is involved in a major project in connection with the widening of Michigan avenue, in Detroit, Mich.; one of the larger yard projects of the year is under construction by the Norfolk & Western at Roanoke, Va.

The Long Island has two important track-elevation projects in progress, one at Rockaway Beach, L. I., to eliminate 40 crossings at grade, and another at Rosedale which will eliminate 12 similar crossings; with the delivery of a considerable number of large freight locomotives, the Southern Pacific has found it necessary to lengthen 111 passing sidings in Arizona, California, Nevada and Oregon, as well as to extend enginehouses and turntables on the districts to which this heavier power has been assigned. This road is also constructing a new bridge over Wax Lake outlet at Calumet, La. In the foregoing list, only projects costing individually $1,000,000 or more have been mentioned, while those included range up to approximately $5,000,000. In addition, a large number of projects ranging from $100,000 to $1,000,000 are reported in the tabulation which accompanies this article.

As an indication that railway officers are recognizing how completely outmoded their stations have become, and that they are desirous of modernizing these facilities, a number of projects of considerable magnitude were reported, involving the construction of new stations or the remodeling of existing ones. Likewise a number of major projects were reported, involving improvements in mechanical department facilities and in water supplies.

The largest of the new line projects is the diversion of the Southern Pacific around the Shasta dam, slightly more than 30 miles in length, which is scheduled for completion early in 1942. This new line is being built for the railway by the Bureau of Reclamation to bring the track above the level of the pool to be formed behind the dam. The construction of this line involves exceptionally heavy work, including a bridge more than 400 ft. above the original level of the Pitt river.

While considerable construction has been carried on in Canada, these projects have been confined largely to those that will facilitate the movement of traffic or to replace structures that are becoming inadequate to meet requirements. Construction in Mexico has remained at low ebb, although some work has been in progress, notably on the line between Calzontzin, Michoacan, and Apalzingan, 78.9 miles, which is now practically completed. Regular service over this line was started on September 15. Preliminary studies and surveys are also underway to determine a satisfactory location for a line between Creel, Chihuahua, and San Pedro, Sinaloa, which is projected to provide a through route for the Kansas City, Mexico & Orient to the west coast of Mexico.

Miles of Lines Abandoned in the United States Since 1917

Year	Miles	Year	Miles
1917	942	1930	694
1918	959	1931	795
1919	637	1932	1,452
1920	536	1933	1,876
1921	1,626	1934	1,995
1922	677	1935	1,843
1923	513	1936	1,523
1924	693	1937	1,140
1925	606	1938	1,897
1926	457	1939	1,783
1927	282	1940	1,299
1928	512	1941	1,509
1929	475		

Abandonments Exceed 1,000 Miles

There was a sharp increase in the miles of lines abandoned during the year, the total being 1,509 miles, compared with 1,299 miles in 1940, a difference of 210 miles. This is the eleventh time since the record of abandonments was first compiled and the tenth consecutive year, that they have exceeded 1,000 miles. The total abandonments for 1941 were 1,455 miles more than the mileage of new lines completed during the year.

The largest single abandonment was that of the Den-

Lines Abandoned in the United States, Canada and Mexico in 1941

	Lines abandoned and taken up	Lines abandoned but not yet taken up
United States	miles	miles
Alabama & Florida		
Cowarts, Ala., to Greenwood, Fla.	....	29.00
Atlantic Coast Line		
Latta, S. C., to Clio	19.78	....
Bishopville, S. C., to Lucknow	7.17	....
Conway, S. C., to Aynor	14.76	....
Fincher, Fla., to Fanlew	31.79	....
Cutler, Fla., to Hamosassa	6.30	....
Micanopy, Fla., to Tacoma	5.22	....
At Lucerne Park, Fla.	0.50	....
Augusta Northern		
Ward, S. C., to Saluda	11.20	....
Baltimore & Ohio		
At Bellington, W. Va.	1.20	....
Leiter Jct., W. Va., to Bellington	8.40	....
Bellefonte Central		
State College, Pa., to Stover	22.77	....
Belt Railway of Chicago		
At Chicago Municipal Airport	1.89	....
Bessemer & Lake Erie		
Allegheny Jct., Pa., to Argentine	....	2.02
Boyne City		
At M. P. 7	0.25	....
Bridgeton & Harrison		
Bridgeton Jct., Me., to Bridgeton	15.92	....
Central of Georgia		
Hartford, Ala., to Lockhart	....	48.09
Central of New Jersey		
Morris County Jct., N. J., to Lake Hopatcong	4.38	....
Lake Hopatcong, N. J., to Edison	9.69	....
Bowenton, N. J., to Greenwich Pier	4.79	....
Chesapeake & Ohio		
Ft. Monroe, Va., to Phoebus	0.65	....
Garrison, Ky., to Poplar	17.42	....
Chesterfield & Lancaster		
Cheraw, S. C., to Pageland	31.75	....
Chicago & North Western		
Carroll, Iowa, to Manning	14.10	....
Watersmeet, Mich., to Choate	21.95	....
Craigsmere, Mich., to Robbins	3.00	....
Wanda, Minn., to Wabasso	5.75	....
Shea Spur, Wis., to Winegar	....	14.62
Chicago, Burlington & Quincy		
Prague, Neb., to Schuyler	18.76	....
Chicago, Milwaukee, St. Paul & Pacific		
Renner, S. D., to Colton	14.05	....
Valeria way line, Great Falls, Mont.	2.18	1.34
Chicago, Rock Island & Pacific		
Orion, Ill., to Milan	12.01	....
Brinkley, Ark., to Newport	....	53.01
Chicago, Springfield & St. Louis		
Curran, Ill., to Lock Haven	70.50	....
Collins & Glenville		
Collins, Ga., to Glenville	....	23.00
Dekalb & Western		
Electric Mills Jct., Miss., to Electric Mills	....	4.60
Denver & Rio Grande Western		
Fremont Jct., Colo., to Fremont	1.74	....
Graham Park Jct., Colo., to North Moyer Jct.	0.99	....
North Moyer Jct., Colo, to Tucson Mine	0.61	....
Mayne, Colo., to Monson	2.40	....
Antonito, Colo., to Santa Fe, N. M.	125.79	....
Detroit, Toledo & Ironton		
Jeffersonville, Ohio, to Sedalia	7.17	....
Duluth & Northeastern		
Saginaw, Minn., to Hornby	46.40	....
Emmitsburg		
Emmitsburg, Md., to Emmitsburg Jct.	7.50	....
Grand Trunk Western		
At Bay City, Mich.	0.92	....
Great Northern		
Kettle Falls, Wash., to Evans	9.99	....
Bossburg, Wash., to Williams	5.27	....
Marcus, Wash., to Boyds	5.96	....
Republic, Wash., to end of Eureka Gulch branch	4.58	....
Illinois Central		
Greenville, Miss., to Riverside Jct.	35.84	....
Hampton, Miss., to Glen Allen	2.00	....

United States	Lines abandoned and taken up miles	Lines abandoned but not yet taken up miles
Jefferson & Northwestern		
Jefferson, Tex., to Linden	19.93	....
Lehigh Valley		
Freeland branch, Pa.	1.59	....
Linville River		
Cranberry, N. C., to Boone	31.57	....
Louisville & Nashville		
Dempster, Ky., to Falls of Rough	4.45	....
O'Fallon Jct., Ill., to O'Fallon	6.05	....
Irvington, Ky., to Fordsville	....	37.73
Hardinsburg Jct., Ky., to Hardinsburg	....	1.73
Hartford, Ky., to Ellmitch	....	18.01
Michigan Central		
Lansing, Mich., to Springport	20.22	3.34
Missouri Southern		
Leeper, Mo., to Bunker	53.80	....
New York Central		
Morenci, Mich., to Fayette, Ohio	6.51	....
New York, New Haven & Hartford		
Bellingham Jct., Mass., to Needham Jct.	3.08	....
Derby Jct., Conn., to Orange	....	1.17
Norfolk & Western		
Banner, Va.	1.31	....
Portion of Simmons Creek branch, W. Va.	0.53	....
Portion of North Fork Elkhorn branch, W. Va.	0.11	....
Kimball, W. Va.	0.07	....
Ragland, W. Va.	3.17	....
Portion of Flipping Creek branch, W. Va.	0.28	....
Portion of Howard branch, W. Va.	0.09	....
Portion of Dans branch, W. Va.	0.33	....
Portion of Simmons Creek branch, W. Va.	....	0.53
Northern Pacific		
Kerriston Jct., Wash., to Kerriston	....	8.74
Wabash, Wash., to Mendota	....	8.76
Northwestern Pacific		
Glen Ellen, Cal., to Los Guilicos	....	6.32
Oklahoma & Rich Mountain		
Page, Okla., to Pine Valley	....	16.95
Pennsylvania		
Evergreen branch, Long Island, N. Y.	0.36	....
Bellwood, Pa., to Blandburg	9.26	....
Curry, Pa., to Henrietta	3.01	....
Grampian, Pa., to Terminus	1.62	....
Pennsylvania-Reading Seashore Lines		
Haddonfield, N. J., Medford, branch	....	0.41
Pere Marquette		
Steiner Spur, Steiner, Mich.	3.70	....
Huron & Western, Bay City, Mich.	7.50	....
Pittsburgh & Lake Erie		
Elwell branch, Pa.	0.06	....
Tyrone branch, Pa.	0.23	....
Port Isabel & Rio Grande Valley		
Brownsville, Tex., to Port Isabel	26.01	....
Reading		
At Lincoln Colliery, Pa.	0.93	....
Robbins		
Rhinelander, Wis., to Headquarters	6.00	....
St. Louis-San Francisco		
Mingo, Mo., to Wappapello	4.77	....
St. Louis Southwestern		
Gatesville, Tex., to Hamilton	32.72	....
Southern		
Georgetown, Ky., to Versailles	16.64	....
Bluff City, Tenn., to Mountain City	45.87	....
Southern Pacific		
Success, Cal., to Clavicle	5.80	....
Yuba City, Cal., to Marysville	0.71	1.30
Esparto, Cal., to Capay	2.43	....
Pernu Jct., Cal., to Pernu	1.48	....
At Toledo, Ore.	0.31	....
At West Chandler, Ariz.	0.92	....
Colorado, Cal., to Potholes	....	11.74
Spokane International		
Corbin Jct., Idaho, to Bayview	11.60	....
Spokane, Portland & Seattle		
Portland, Ore., to Greenburg	....	9.47
Garden Home, Ore., to Beaverton	....	3.04
At Portland, Ore.	....	0.91
Texas & Pacific		
Mineral Wells, Tex., to Salesville	7.84	....
Union Pacific		
Crestmore, Cal., to Rialto	5.00	0.19
North River Jct., Ore., to Primo	4.13	11.13
Uvalde & Northern		
Uvalde Jct., Tex., to Camp Wood	37.10	....
Venturi County		
Wood Road, Cal., to Nauman beet dump	1.35	....
Western Maryland		
Oakmont, W. Va., to Emoryville	2.06	....
Wichita Northwestern		
Pratt, Kan., to Vaughn	74.49	....
Trousdale, Kan., to Kinsley	23.94	....
Junction, Kan., to Iuka	1.04	....
Wrightsville & Tennile		
Southwest Jct., Ga., to Eastman	28.50	....
Southwest Jct., Ga., to Hawkinsville	35.91	....
	1,191.67	317.15
Canada		
Canadian National		
Domberg, P. Q., to Jacques Cartier river	3.95	....
Parisville, P. Q., to Deschaillons	3.54	....
Marmora branch, Ont., M. P. 3.33 to 9.52	6.19	....
Whitby, Ont., to Port Perry	17.50	....
Clinton Jct., Ont., to Wingham Jct.	22.93	....
Yarker, Ont., to Tweed	33.94	....
Oakland, Man., to Delta	5.45	....
Red Deer Jct., Alta., to Red Deer	....	5.06
Canadian Pacific		
Mando, P. Q., to Point Fortune	6.80	....
Michigan Central		
Niagara Jct., Ont., to Chippewa	10.22	....
Philipsburg Railway & Quarry Company		
At Philipsburg, Que.	7.00	....
Temiscouata		
Edmundston, N. B., to Baker Brook	12.00	....
	129.52	5.06

ver & Rio Grande Western, with 125.79 miles abandoned between Antonito, Colo., and Santa Fe, N. M. The second largest abandonment, as well as the largest abandonment of an entire railway, was that of the Wichita Northwestern, 99.47 miles. The Chicago, Springfield & St. Louis, with 70.50 miles abandoned, was third in the amount of line abandoned. The Missouri Southern stood fourth in the total mileage abandoned, but second in mileage for the abandonment of an entire line, with 53.80 miles abandoned between Leeper, Mo., and Bunker. The third largest abandonment of an entire line was that of the Uvalde & Northern, 37.10 miles, between Uvalde Junction, Tex., and Camp Wood, and the fourth was that of the Chesterfield & Lancaster, between Cheraw, S. C., and Pageland.

It is significant that 14 entire railways were abandoned in 1941, one more than during the previous year. This compares with 17 complete abandonments in 1939, the largest for any single year. Authority for the abandonment of several additional lines has been given by the Interstate Commerce Commission, and these lines will be abandoned early in 1942, as legal formalities can be completed. The abandonments reported in any year include all lines abandoned permanently during the year, regardless of whether the tracks have been taken up at the end of the year and are not included in later years when the tracks are actually taken up.

Abandonments were not recorded prior to 1917, for the few lines that were abandoned from time to time were unimportant and usually were in sparsely populated sections, being generally logging roads or those serving mines, while they occurred so sporadically as to attract little attention. Beginning with 1917, however, in which year 942 miles of main lines were abandoned, abandonments have continued on a large scale, the mileage abandoned in individual years having ranged from 282 in 1927 to 1,995 in 1934. During the entire 25-year period beginning with 1917, a total of 26,700 miles of lines have been abandoned, an average of almost 1,100 miles annually, while only 10,610 miles of new lines have been constructed, leaving a net decrease of 16,090 miles of road.

Of equal interest with the mileage abandoned by individual roads and the total for all roads, is the distribution of these abandonments by states, for the states themselves are vitally concerned. During the 10 years ending with 1941, a total of 16,316 miles were abandoned in the 48 states and Alaska. During this ten-year period Texas leads with 925 miles, while Missouri is a close second with 914 miles, Michigan follows with 800 miles and Iowa ranks fourth with 772 miles abandoned. By regions, the abandonments during these 10 years have been: New England states, 781 miles; North Atlantic states, 1,415 miles; Southeastern states, 3,240 miles; Middle Western states, 4,351 miles; Northwestern states, 1,181 miles; Southwestern states, 3,695 miles; and the Pacific Coast states, 1,411 miles.

Prior to 1932, abandonments in Canada and Mexico had been negligible. In 1932 and 1933, however, the Canadian roads abandoned a total of 282 miles, since which time abandonments have ranged from 55 to 399 miles annually. In 1941, a total of 135 miles were abandoned. During the 10-year period beginning with

1932, a total of 1,142 miles of lines have been abandoned in Canada.

No abandonments were reported by the roads in Mexico, although operation is still suspended on several lines that normally serve mining properties.

Following is a detailed report by roads of construction projects completed during 1941 or still in progress at the end of the year, the individual cost of which approximates or exceeds $100,000, except grade separations, which are recorded regardless of cost:

Railway Construction in the United States

(Figures in parentheses indicate percentage of completion at the end of 1941)

Alabama, Tennessee & Northern

First Track: On Blakely Island, Mobile, Ala., 1.54 miles.

Alaska

Important Work Undertaken: New freight warehouse and re-arrangement of tracks, Anchorage, Alaska, $147,500 (80). New passenger station and general office building, Anchorage, Alaska, $260,000 (20). Replacement of timber trusses with steel trusses, Indiana River crossings, Canyon, Alaska, $120,000 (85). Construction of dormitory and eating house, Eska, Alaska, $100,000 (100).

New Line Under Construction: New line, Whittier, Alaska, to Portage, 12.50 miles, $5,300,000 (1).

Alton

Grade Crossing Elimination: Overcrossings: Route 5, Normal, Ill., $146,000 (100). Route 158, Pleasant Hill, Ill., $59,000 (100). Route 3, Armstrong, Mo., $77,000 (20).

Subways: Route 4, Carlinville, Ill., $295,000 (30). Route 5, Lincoln, Ill., $120,000 (100).

Alton & Southern

Important Work Undertaken: Extension to enginehouse, including new heating plant and material storage facilities, $145,000 (100). New 5,000,000 bushel grain elevator and storage tracks $570,538 (70).

Atchison, Topeka & Santa Fe

Grade Crssing Elimination: Subways: Pauline, Kansas (25). Huntington Drive, Arcadia, Cal. (100). Fremont Ave., Arroyo Seco Parkway, So. Pasadena, Cal. (100). Avenue 35, Arroyo Seco Parkway, Los Angeles, Cal. (100).

(Gulf, Colorado & Santa Fe) Overcrossing: Zang Blvd., Dallas, Tex. (25).

(Panhandle and Santa Fe) Subway: Cuyler St., Pampa, Tex., (70).

Important Work Undertaken: Yard changes, Belen, N. M., (80). Line change and renewal of bridge 306-B, Red Rock, Okla., (100). Renew bridge E-208, San Onofre, Cal., (100). New yard layout, San Diego, Cal., (75). Line change, curves 36 to 49, San Clemente, Cal., (100).

Atlanta, Birmingham & Coast

Grade Crossing Elimination: Overcrossings: Manchester, Ga., $86,000 (100). Meriwether county, Ga., $30,000 (100). Warm Springs, Ga., $40,000 (100). Widening existing overcrossing, Shelby county, Ala., $30,000 (80).

Subway: Moultrie, Ga., $55,000 (100).

Baltimore & Ohio

Grade Crossing Eliminations: Track elevation joint with state, Grant City, S. I., N. Y., to Bay Terrace, $3,800,000 (5). Elimination of Chili Ave. joint with Penna. R. R. and state, Rochester, N. Y., $400,000 (100). Market St. extension, McKeesport, Pa., $270,000 (95).

Overcrossings: Leslie, Md., $130,000 (100). Branchville, Md., $150,000 (40). Webster, W. Va., $150,000 (50). Norton, W. Va., $145,000 (50). Eighty-Four, Pa., $245,000 (100). Evans, Pa., $290,000 (100). Columbia Center, Ohio, $215,000 (100). Galatea, Ohio, $260,000 (100). Strasburg, Ohio, $220,000 (80). Mansfield, Ohio, $255,000 (45).

Subways: Flemington, W. Va., $110,000 (100). Folsom, W. Va., $125,000 (100). Poast Town, Ohio, $295,000 (100). Avilla, Ind., $90,000 (100).

Reconstruction of Existing Grade Separation Structure: Viaduct, Richmondale, Ohio, $140,000, (100).

Important Work Undertaken: New viaduct joint with Penna. R. R., 9th Street, Washington, D. C., $475,000 (80). Team tracks at K st. and Wisconsin ave., Georgetown, D. C., $340,000 (100). Strengthening bridges, W. Va., and Pittsburgh branch, $600,000 (90). Bank protection, Mahoning Dam, Smicksburg-Loop, Pa., $415,000 (95). Spur to ordnance plant, Ravenna, Ohio, $150,000 (100). Construction of Coleman branch, Listie, Pa., $565,000 (15). Reconstruction of bridge, Mt. Sterling, Ohio, $110,000 (25).

Bangor & Aroostook

First Track: Oakfield, Me., 0.15 mile.

Grade Crossing Elimination: Subway: Including track raise and extension of culverts, Oakfield, Me., $125,990 (99).

Belt Railway of Chicago

First Track: 59th st. and Menard ave. to 52nd st. and Kenton ave., Chicago, 2.31 miles.

Second Track: 59th st. and Menard ave. to 52nd st. and Kenton ave., Chicago, 2.31 miles.

Bessemer & Lake Erie

Important Work Undertaken: Enlargement of winding basin in harbor at Conneaut, Ohio, $240,000 (25).

Birmingham Southern

Important Work Undertaken: Locomotive and car shop, including overhead crane and machine tools, Fairfield, Ala., $154,000 (20).

Blue Ridge

Grade Crossing Elimination: Overcrossing: Peoples st., Anderson, S. C., $75,000 (100).

Boston & Maine

Grade-Crossing Eliminations: Overcrossings: State and Furnace sts., North Adams, Mass., $252,600 (100). Hoyt's and Folsom's crossings, Orange, N. H., $68,000 (100). Frazier's crossing, Grafton, N. H., $40,000 (100).

Important Work Undertaken: Relocation of line around Birch Hill flood control dam, Royalston, Mass., 4.46 miles, $1,000,000 (paid by U. S.) (100).

Canadian National (Lines in the United States)

Grade Crossing Elimination: Overcrossings: South Saginaw st., Flint, Mich., (100). Fort Custer dr., Battle Creek, Mich., (to be completed 1942).

Subways: Six Mile road, Detroit, Mich. Michigan Ave., Detroit, Mich., (100).

Important Work Undertaken: Construction of viaduct over Penna. and Baltimore & Ohio Chicago Terminal, Chicago, Ill., (to be completed in 1942).

Central of Georgia

Grade Crossing Elimination: Overcrossings: Raymond, Ga., $16,645, (100). Wire Bridge, Ga., $11,958 (100). Experiment, Ga., $49,324 (100). McIntyre, Ga., $82,000 (40).

Subway: Opelika, Ala., $69,700 (100).

Central of New Jersey

Grade Crossing Eliminations: Overcrossing: West avenue, Sewaren, N. J., $303,000 (100).

Important Work Undertaken: Improvements to freight terminal yard, Jersey City, N. J., $400,000 (90).

Chesapeake & Ohio

First Track: Prestonsburg, Ky., to David, 9.85 miles. Holden, West Virginia, 0.04 mile.

Second Track: Strathmore, Va., to Shores, 0.53 mile.

Grade Crossing Elimination: Overcrossings: Construction of overhead bridge includes relocating Route 31, Pratt, W. Va., to Hansford, $200,000 (100). LeMoyne, Ohio, $287,000 (50). Riverton, Ky., $96,254, Mt. Sterling, Ky., $115,000.

Subways: Coal Haven, Ky., $110,000. Columbus, Ohio, $120,000.

Important Work Undertaken: Thirteen additional classification tracks, Newport News, Va., $160,775 (100). Improvement of car repair facilities and additional test tracks, Newport News, Va., $133,815 (95). Two cranes and additional track for handling ore, Newport News, Va., $328,000 (99). Twelve additional storage warehouses, Morrison, Va., $390,000 (100). Additional tracks, Fulton yard, Richmond, Va., $160,500 (2). Filling James River Canal, rearrangement of tracks and paved driveways, Richmond, Va., $164,350 (98). Grade and line revision and retirement of Greenwood Tunnel, Greenwood, Va., $232,000 (1). Grade and line revision and construction of new 4200-ft. Blue Ridge Tunnel, Afton, Va., $1,530,200 (1). Line change, Frazier, W. Va., $118,050 (90). Additional unit to company hospital, Huntington, W. Va., $172,000 (40). Additional tracks, Ashland, Ky., $185,900 (100). Yard office building, underpass and tube system, Russell, Ky., $164,000 (100). Subdrainage, trench and rock backfill, Concord, Ky., $110,745 (100). Rearrangement of passing sidings and installation of centralized traffic control, Carntown, Ky., to CS Cabin, $177,470 (10). Team tracks with viaduct connection, Cincinnati, Ohio, $232,198 (90). Improvement of coal sprinkling facilities on dumpers, Presque Isle, Ohio, $135,000 (100). Eight additional storage warehouses, Morrison, Va., $235,000. Fill James River canal, Lynchburg, Va., $108,500. Home for hospital nurses, Clifton Forge, Va., $110,000 (100). Installation of crossovers and traffic locking on both main tracks, *BS Cabin to Jerrys Run, Va., $117,000. Rearrangement of passing siding, Ashland, Ky., to Netherland, $103,280 (100). Replacement of Calumet grain elevators, South Chicago, Ill., $350,000 (100).

Chicago & Eastern Illinois

Grade Crossing Eliminations: Subway: South Holland, Ill., $210,000 (100).

Chicago & Illinois Midland

Grade Crossing Elimination: Relocation of Highways: Tice, Ill., $1,200 (5). Menard county, Ill., $2,000 (90).

Chicago & North Western

Grade Crossing Elimination: Overcrossings: Omaha, Neb., $43,500 (100). Viaduct, Elm street, Hastings, Neb., joint with St. Joseph & Grand Island and Missouri Pacific, $83,000 (100). Grade separation, Winnetka, Ill., involves track elevation and depression, 9 overhead bridges and 3 subways, $4,000,000 (100).

Subways: Durand road, Willow, Wis., $200,000 (60). Westleigh road, Lake Forest, Ill., $450,000 (35). Route 139, Crystal Lake, Ill., $100,000 (100). Sleepy Eye, Minn., $100,000 (100). Route 73, Omaha, Neb., $44,000 (100). Touhy Ave., Park Ridge, Ill., $320,000 (90).

Reconstruction of Existing Grade Separation Structures: Bluff Street, Janesville, Wis., $136,000 (70).

Important Work Undertaken: Facilities for servicing streamline trains, Chicago, Ill., $370,000 (100). Additional machine shop, North Green Bay, Wis., $136,000 (100).

Chicago, Burlington & Quincy

Grade Crossing Elimination: Overcrossings: Oregon, Ill., $75,000 (10); Smithboro, Ill., $80,000 (95). Pacific Jct., Iowa, $60,000 (20). Pacific Jct., Iowa, $60,000 (20). Burlington, Iowa, $100,000, $100,000 (5). Red Oak, Iowa, $30,000 (100). Miner, Wis., $65,000 (100). St. Paul, Minn., $297,000 (100). Table Rock, Neb., $125,000 (100). Fairmont, Neb., $75,000 (100). Oreville, S. D., $154,000 (100). Denver, Colo., $25,000 (100).

Subways: Brookfield, Mo., $300,000 (95). Ft. Crook, Neb., $50,000 (100). Denver, Colo., $50,000 (100). Casper, Wyo., $170,000 (100).

Chicago, Milwaukee, St. Paul & Pacific

Grade Crossing Elimination: Overcrossings: Willow Road, Techny, Ill., (5). Ferguson, Iowa, $50,000 (100). Bellevue, Iowa, $100,000 (50). Construction, including relocation of highway, Route 30, Madison, Wis., $50,000 (20). Lake-College ave., Milwaukee, Wis., $215,000 (100). Reserve st., St. Paul, Minn., $108,000 (75). Mendota, Minn., $30,000. Construction, including relocation of highway, Route 12, Milbank, S. D., $153,000 (100). Route 19, Moore, Mont., $41,000 (75).

Subways: Route 59, W. Lake Forest, Ill., $200,000 (100). Willow road, Techny, Ill., (5), Crestwood, Wis., $110,000 (100). Wyocena, Wis., $70,000 (100). Elko, Minn., $30,000 (2). Nebraska st., Mobridge, S. D., $81,000 (5). Hettinger, N. D., $211,000 (5).

Relocation of Highways: Route 16, Draper, S. D., to Vivian, $80,000 (50). Route 50, Wagner, S. D., $80,000 (85). Route 83, Temvik, N. D., to Linton, $70,000 (25).

Reconstruction of Existing Grade Separation Structures: Marion, Iowa, $75,000 (100). Janesville, Wis., $40,000 (90). Worley, Idaho, $14,000 (100)

Chicago, Rock Island & Pacific

Grade Crossing Eliminations: Overcrossings: Route 216, Solon, Iowa, $45,000 (100). Route 218, Faribault, Minn., $114,000 (100). Route 172, Harvard st., Peoria, Ill., $40,000 (10). Route 9, Larchwood, Iowa, $30,000 (100). Roosevelt road, Little Rock, Ark., $70,000 (10). Route 81, El Reno, Okla., $201,000 (15). Route 77, Carrollton, Tex., $150,000 (10).

Subways: Somers, Iowa, $35,000 (100). May ave., Oklahoma City, Okla., $137,000 (100). University ave., Des Moines, Iowa, $150,000 (20).

Important Work Undertaken: Line and grade revision, Mercer, Mo., to Mill Grove, $2,000,000 (25).

Chicago, St. Paul, Minneapolis & Omaha

Grade Crossing Elimination: Overcrossing: Forest st., St. Paul, Minn., $140,000 (40).

Subway: Worthington, Minn., $130,000 (60).

Clinchfield

Grade Crossing Elimination: Subway: Kingsport, Tenn., $7,700 (100).

Danville & Western

Grade Crossing Elimination: Reconstruction of Existing Grade Separation Structure: Replacement of wooden overcrossing, Martinsville, Va., $25,000 (100).

Delaware & Hudson

First Track: Connection to N. Y. C. from Plumadore, N. Y., 0.15 mile.

Important Work Undertaken: Improvements to engine house, Oneonta, N. Y., $113,000 (100). Improvements to main shop, Colonie, N. Y., $120,000 (20). Reconstruction of superstructures and bridges, Fort Edward, N. Y., $315,000 (100). Raise bridge over Barge Canal and install two additional spans, West Waterford, N. Y., $200,000 (30). Revision of grade and increased clearance through tunnel, Tunnel, N. Y., $140,000 (25).

New Line Projected: Ballston Spa., N. Y. to Saratoga Springs, 2.22 miles.

Delaware, Lackawanna & Western

Grade Crossing Elimination: Overcrossings: Highway elevation over two tracks, Danforth road, Madison, N. J., (100). Highway elevation over two tracks, Riverview drive, Totowa Boro, N. J., (30). Construction of overhead highway bridge, Leicester, N. Y., (100). Reconstruction of overhead bridge, Galena, N. Y., (20).

Subways: Track elevation to eliminate 21 grade crossings and remove tracks from city streets, Syracuse, N. Y., joint with state (100). Construction of three-track bridge, Dansville, N. Y., (50). New double track railroad bridge, Groveland, N. Y., (100). Union road, Cheektowaga, N. Y., joint with Lehigh Valley and Erie, (100). Bridge road, Chenango Bridge, N. Y., (100).

Important Work Undertaken: Inshore extension, 121 ft., to coal loading pier, dredging hannel and installation of steel sheet piling, Oswego, N. Y., (100).

Denver & Rio Grande Western

Grade Crossing Elimination: Overcrossing: Including relocation of highway, 1.3 miles, Pando, Colo., $130,305 (90).

Subway: Altus, Utah, $32,000 (75). Park City branch 1½ miles east of Altus, Utah.

Important Work Undertaken: Extension of passing sidings and installation of centralized traffic control, Dotsero, Colo., to Chacra, and Midwest, Colo., to Tunnel, $232,000 (98). Construction of commissary, yard service and battery buildings; track changes; inspection pits and other facilities, Burnham, Colo., $105,000 (90). Enlargement of enginehouse, including extension of 11 stalls and installation of heating plant, Grand Junction, Colo., $110,000 (100).

Denver & Salt Lake

Grade Crossing Elimination: Relocation of highway to eliminate three grade crossings, Oak Creek, Colo., $3,000 (100).

Detroit & Toledo Shore Line

Grade Crossing Elimination: Overcrossing: Viaduct, Erie Township, Mich., (62).

Detroit Terminal

Grade Crossing Elimination: Overcrossing: Ford road, Dearborn, Mich., $250,000 (100).

Detroit, Toledo & Ironton

Grade Crossing Elimination: Overcrossing: Construction of bridge carrying Route 223 over Wabash and Detroit, Toledo & Ironton tracks, Adrian, Mich., $130,000 (100).

Duluth, Missabe & Iron Range

Grade Crossing Elimination: Subway: Construction of second lane of Highway 61, Thompson hill, Duluth, Minn., $100,000 (to be completed in 1942).

Duluth, South Shore & Atlantic

Grade Crossing Elimination: Overcrossing: Nestoria, Mich., $75,000 (100).

Elgin, Joliet & Eastern

Grade Crossing Elimination: Subway: Route 131, Warrenhurst, Ill., (90).

Erie

Grade Crossing Elimination: Construction of two overcrossings, one subway and one pedestrian subway to eliminate six grade crossings, Monroe, N. Y., (100). Elevation of track to eliminate two grade crossings, Dunkirk, N. Y., (76). Route 171, Hoadleys, Pa., (5). Route 501, Mansfield, Ohio, (8).

Overcrossings: Route S-3 Rutherford, N. J., (5). Johnson City, N. Y., (100). New overcrossing and relocation of a portion of the Erie, West Middlesex, Pa., (100).

Subways: Route 220, Shohola, Pa., (100). Union road, Cheektowaga, N. Y. joint with D. L. & W. and Erie (100). Route 31, Hamburg, N. Y., (100).

Reconstruction of Existing Grade Separation Structures: Bridge H-39.69, Southfields, N. Y., (5). Bridge 291.78, part of Corning Flood Control, Painted Post, N. Y., (100). Reconstruction of Bridge 39.32, Lakewood, N. Y., (32).

Georgia & Florida

Grade Crossing Elimination: Installation of Evans Auto-Stop device at crossing with Route 27, Hazlehurst, Ga., $13,921 (100).

Georgia

Grade Crossing Elimination: Subway: Union Point, Ga., $13,000 (100).

Great Northern

First Track: Galena, Wash., to East Galena (Sunset Airport) 8.16 miles. Kettle Falls, Wash., to Boyds, account construction of Grand Coulee dam, 27.91 miles.

Grade Crossing Elimination: Overcrossings: Minneapolis, Minn., $50,000, Repairs to overhead bridge, Minneapolis, Minn., $5,700. Replacement of overhead bridge, Melrose, Minn., $36,784. Waite Park, Minn., $194,500. Replacement of overhead bridge, Kerkhoven, Minn., $35,882. Replacement of foot bridge, Minot, N. D., $9,435. Libby, Mont., $80,703. Troy, Mont., $245,593. Barstow, Wash., $21,575. Renewal of overhead bridge, Trinidad, Wash., $530. Viaduct, Seattle, Wash., $23,400. Renewal of overhead bridge, Seattle, Wash., $3,800.

Subway: Towner, N. D., $28,069.

Reconstruction of Existing Grade Separation Structures: Reconstruction of High st. bridge, Minneapolis, Minn., $99,000.

Important Work Undertaken: Reducing curvature, widening roadbed, applying additional ballast and laying 112-lb. rail, Nickerson, Minn., to Foxboro, $342,775 (100). Reducing curvature, widening roadbed, applying additional ballast and laying 112-lb. rail, Hutch Junction, Minn., to Delano, $450,265 (100). Reducing curvature, widening roadbed, applying additional ballast and laying 112-lb. rail, Roach, N. D., to Palermo, $328,200 (100). Widening embankments, applying additional ballast and laying 112-lb. rail, Wheelock, N. D., $120,450 (100). Widening embankments, applying additional ballast and laying 112-lb. rail, Pacific Junction, Mont., to Kremlin, $276,160 (100). Widening embankments, applying additional ballast and laying 112-lb. rail, Highland, Wash., to Galena, $128,900 (100). Widening embankments, applying additional ballast and laying 112-lb. rail, Wenatchee, Wash., to Peshastin, $291,150 (100). Widening embankments, applying additional ballast and laying released rail, Dumblane, Minn., to Onega, $109,100 (100). Widening embankments, applying additional ballast and laying released rail, Dresden, N. D., to Hannah, $133,600 (100). Widening embankments, applying additional ballast and laying released rail, Lester, Iowa, to Doon, $165,430 (100). Widening embankments, applying additional ballast and laying released rail, Niobe, N. D., to Lignite, $133,900 (15). Widening embankments, applying additional ballast and laying released rail, Teton, Mont., to Carter, $166,850 (50). Widening embankments, applying additional ballast and laying released rail, Geyser, Mont., to Moccasin, $229,000 (35). Widening embankments, applying additional ballast and laying released rail, Hugo, Wash., to Omak, $309,000 (65). Ore steaming facilities, Allouez, Wis., $123,950 (100). Extension of yard, Minot, N. D., $157,600 (30). Snowshed, Singleshot, Mont., $116,330 (100). Track to government airport, Galena, Wash., $135,000 (100). Additional yard tracks, South Klamath, Ore., $119,000 (10).

Green Bay & Western

Grade Crossing Elimination: Overcrossing: Waupaca County, Wis., $34,700.

Gulf Coast Lines

Important Work Undertaken: Construction of high level crossing over

Morganza floodway, including 6.2 miles of line change, Krotz Springs, La., to Lottie, $2,198,389 (25).

Gulf, Mobile & Ohio

Grade Crossing Elimination: Subways: New Albany, Miss., $4,411.84 (100). Houston, Miss., (100).

Houston Belt & Terminal

Grade Crossing Elimination: Overcrossing: U. S. Highway 75, Houston, Tex., $150,000 (100).

Illinois Central

Grade Crossing Eliminations: Overcrossings: Church, Ill., $100,000 (100). Robbs, Ill., $55,000 (100). Villa Park, Ill., $30,000 (100). Springfield, Ill., $135,000 (100). Dubuque, Iowa, joint with Chicago, Milwaukee, St. Paul & Pacific, $408,000 (50). Valley, Miss., $60,000 (100). Grenada, Miss., $65,000 (100).

Subways: Pinckneyville, Ill., $109,000 (100). Mt. Pulaski, Ill., $50,000 (100). Jackson, Miss., $187,600 (90).

Kansas City Southern

Important Work Undertaken: Replacing bridge over Neches River at Beaumont, Tex., $435,055 (100).

Laurinburg & Southern

Grade Crossing Elimination: Relocation of crossing, East Laurinburg, N. C., $3,500 (60).

Lehigh & New England

Grade Crossing Elimination: Overcrossing: Sussex, N. J., $259,120 (100).

Lehigh Valley

Grade Crossing Elimination: Overcrossing: Tioga street, Spencer, New York, $205,000 (80).

Relocation of Highway: Includes new viaduct, Route 169, Olivers Mills, Pa., $60,000 (100).

Reconstruction of Existing Grade Separation Structures: Bridge 392, Caledonia, N. Y., $32,266 (100). Bridge 442, Amherst, N. Y., $133,773 (100).

Louisville & Nashville

Grade Crossing Elimination: Overcrossings: Munford, Ala., $19,000 (100). Minooka, Ala., $20,000 (100). Sardis, Ala., $35,000 (100). Adair st., Louisville, Ky., $300,000 (100). Clutts, Ky., $40,000 (100). E. Bernstadt, $80,000 (50). West Point, Ky., $275,000 (20). Fariston, Ky., $80,000 (50). Williamsburg, Ky., $80,000. National Cemetery, Tenn., $148,600 (100). Knoxville, Tenn., $400,000 (50). Milligan, Fla., $60,000 (100). Pennington Gap, Va., $15,320 (10).

Subways: Birmingham, Ala., $200,000 (100). Trinity Lane, Tenn., $85,000 (100).

Important Work Undertaken: Replacement of bridge and construction of new pier, Ford. Ky., $151,114 (10).

Maine Central

Grade Crossing Elimination: Overcrossing: St. Johnsbury, Vt., $320,000 (50).

Subway: Fairfield, Me., $276,000 (25).

Important Work Undertaken: Rebuilding yard and construction of new passenger station, Bath, Maine, $120,000 (100).

Minneapolis, St. Paul & Sault Ste. Marie

Grade Crossing Elimination: Overcrossings: Hamel, Minn., $75,000 (100).

Subways: Wyndmere, N. D., $60,000 (100). Waupaca, Wis., $100,000 (100).

Minnesota Transfer

Important Work Undertaken: Industrial tracks to serve the Twin City ordnance plant, New Brighton, Minn., $211,000 (100).

Missouri & Arkansas

Grade Crossing Elimination: Overcrossing: Everton, Ark., $1,250 (100).

Missouri-Kansas-Texas

Grade Crossing Elimination: Overcrossings: Route 40, Lloyds, Mo., $106,400 (50). Route 270, McAlester, Okla., $125,000 (100).

Subways: Route 19, Atoka, Okla., $129,000 (18). Route 69, Tullahassee, Okla., $82,000 (4). Route 78, Leonard, Tex., $80,000 (100). Hines Boulevard, Dallas, Tex., $125,000 (100). Routes 95 and 20, Elgin, Tex., $90,000 (100). Route 246, Honey Springs, Tex., $75,000 (100).

Missouri Pacific

Grade Crossing Elimination: Overcrossings: Route 71, Texarkana, Ark., $172,000 (100). Route 65, Amboy, Ark., $135,000 (100). Route 14, Hoberg, Mo., $100,000 (100). Route 69, Wagoner, Okla., $75,000. Route 6, Hastings, Neb., joint with Union Pacific and Chicago & North Western, $300,000 (100). Plattsmouth, Neb., $14,000 (100).

Subways: Gravois Ave., St. Louis, Mo., $330,000 (95). Route 54, Batesville, Kan., $150,000 (100). Route 10, Ft. Gibson, Okla., $60,000 (100). Joplin, Mo., $42,000 (100).

Important Work Undertaken: Raising of grade to reconstruct bridges, Harviell, Mo., $134,000 (100). Produce yard and viaduct over Grand ave., construction of inspection and team tracks for handling perishable shipments, Kansas City, Mo., $1,063,000 (100). Replacement of swing span on timber pivot with girder spans, Parkin, Ark., $120,000 (50). Construction of new lead, etc., to serve new incline, Natchez, Miss., $182,000 (100). Install boilers in power house, Kansas City, Mo., $113,800 (100).

Nashville, Chattanooga & St. Louis

Grade Crossing Elimination: Overcrossing: Jones Ave., Atlanta, Ga., $100,000 (5).

Subways: Bolton, Ga., $125,000 (100). Nashville, Tenn., $220,000 (25).

Important Work Undertaken: Construction of spur track to reach T. N. T. plant, Tyner, Tenn., $150,000 (100).

Nevada Northern

Grade Crossing Elimination: Overcrossing: Keystone, Nevada, $75,000 (100).

Important Work Undertaken: Reconstruction of shops and enginehouse, East Ely, Nev., $120,000 (100).

New Orleans Public Belt

Second Track: New Orleans, La., to Louisiana Shipyards, Inc., 0.16 miles.

Important Work Undertaken: Track siding to serve Louisiana Shipyards, Inc., New Orleans, La., 7.01 miles, $200,000 (100).

New York Central

Fourth Track: At Dunkirk, N. Y., 1.23 miles.

Grade Crossing Elimination: Revision of alinement eliminating 7 crossings on main line, Herkimer, N. Y., $3,380,000 (50).

Overcrossings: Botanical Gardens, New York, N. Y., $180,500 (100). Dover Plains, N. Y., $262,000 (100). Skaneateles-Camillus State Highway 897, Martisco, N. Y., $123,000 (99). State Highway 67, Bay View, N. Y., joint with Penna., $107,900 (99). Ft. Hunter rd. carried over new location, Schenectady rd. closed, South Schenectady, N. Y., $597,000 (99). Main st. to be carried on new location, construction of pedestrian subway, Bedford Hills, N. Y., $620,200 (90). Transit rd., Bowmansville, N. Y., $191,100 (100). Main st., crossing eliminated, Philadelphia, N. Y., $162,300 (30). Elimination of Main st. crossing, Becket, Mass., $114,000 (50). Elimination of 13 grade crossings by carrying line over depressed grades of 7 highways and by construction of pedestrian subway at another, Dunkirk, N. Y., $3,000,000 (85). Cemetery rd., Erie, Pa., joint with New York, Chicago & St. Louis, $138,700 (100). Elimination of grade crossing, State Highway 213, Hadley, Pa., $183,400 (95). U. S. Highway 30-S, Kenton, Ohio, $172,518 (100). U. S. Highway 20, Rolling Prairie, Ind., $142,120 (100).

Subways: Farnham-Irving State Highway 5600, Irving, N. Y., $163,900 (99). Depression of Lake St., and closing of Pearl St., North East, Pa., $304,600 (90). Richmond St., Painesville, Ohio, $425,550 (20). West 130th St., Cleveland, Ohio $523,425 (65). State Highway 918 depressed and carried under railroad, North Macedon, N. Y., $338,300 (90). Depression of Allegheny St. under tracks, and closing of Railroad St., Corfu, N. Y., $386,600 (85). Miller and Goodyear Avenues, E. Buffalo, N. Y., $683,900 (40). State Highway 640 and construction of pedestrian subway, Pattersonville, N. Y., $326,900 (10). State Highway 297, Utica, N. Y., $211,000 (90).

Relocation of Highway: Midland Trail, U. S. Highway 60, Charleston, W. Va., $122,480 (100).

Reconstruction of Existing Grade Separation Structures: 30th St. Yard, New York, N. Y., $5,964,000 (100). Widening of pavement on reconstructed bridge, Croton Falls, N. Y., $324,500 (100). Reconstruction of Bridge T-7, Aqueduct, N. Y., $124,500 (25). Blasdell, N. Y., $73,100 (99). Melrose, New York, N. Y., $508,300. 138th St., New York, N. Y., $95,000 (99). Richmond, Mass., $119,000 (50).

Important Work Undertaken: Erection of one-story building 750 ft. by 78 ft. West 30th St., New York, N. Y., $367,700 (100). Strengthening bridges, raising tracks and revising approach signal distances, Weehawken, N. J. to Selkirk, N. Y., $390,000 (100). Raising bridge P-4 over New York State barge canal to increase clearance, Three River Point, N. Y., $156,000 (100). Raising bridge R-70 over New York State barge canal to increase clearance, Rome, N. Y., $191,500 (1). Raising bridge OL-544 over New York State barge canal to increase clearance, Rome, N. Y., $178,400 (1).

(Cleveland, Cincinnati, Chicago & St. Louis) Overcrossing: Sherman Dr., Indianapolis, Ind., $185,000 (100). Subway: Forest, Ohio, $100,000 (100).

Important Work Undertaken: Extension of enginehouse stalls, installation of two drop tables and monorail crane, raising of water tank, changes in sewer and water lines and relocation of engine washing platform, Bellefontaine, Ohio, $102,000 (100).

(Michigan Central) Overcrossings: Military Ave., Dearborn, Mich., $270,000 (100). Vassar, Mich., $48,000 (100).

Reconstruction of Existing Grade Separation Structures: Bridges over Michigan Ave., account widening street, Detroit, Mich., $1,156,000 (100).

New York, Chicago & St. Louis

Grade Crossing Elimination: Overcrossings: Cemetery Rd., Esmer, Pa., $223,906 (100). U. S. Route 20, Amboy, Ohio, $362,150 (100).

Subways: State Route 5600, Irving, N. Y., $375,000 (100). South Lake and Pearl Sts., North East, Pa., $222,391 (100). Route 1, Hoopeston, Ill., $40,000 (100). Brigham Rd. and Central Ave., Dunkirk, N. Y., $700,000 (100).

Important Work Undertaken: Construction of steel viaduct replacing frame trestle, Cowden, Ill., $157,919 (100). Lead track, scales, drainage and water line at Calumet Yard, Chicago, Ill., $132,480 (100). Construction of steel viaduct replacing frame trestle and realignment of 2780 ft. of main track, Ramsey, Ill., $149,293 (10). Extension of passing sidings and installation of centralized traffic control, Hadley, Ind. to South Whitley, $102,125 (35).

New York, New Haven & Hartford

Grade Crossing Elimination: Overcrossings: Hutchison River parkway, New York, N. Y., $325,000 (100). Elimination of 2 crossings, Wilton, Conn., $165,000 (100). Elimination of crossing and construction of viaduct, Boston, Mass., $130,000 (5). Northbridge, Mass., $120,000 (50). Elimination of crossing and construction of viaduct, Northbridge, Mass., $100,000 (80). North Falmouth, Mass., $100,000 (30). Hartford, Conn., $200,000 (100). Warwarme Ave., Hartford, Conn., $300,000 (80). Boule-

yard Tunnel, Hartford, Conn., $250,000 (80). Bypass Rd., Northfield, Conn., $100,000 (80). New London, Conn., $200,000 (80).

Subways: Brewster, N. Y., $250,000 (100). Manchester, N. Y., $315,000 (100).

Reconstruction of Existing Grade Separation Structures: Widening of subway, E. Greenwich, R. I., $147,000 (100). Reconstruction of overcrossing, Chelmsford, Mass., $100,000 (100). Reconstruction of overcrossing, Abington, Conn., $100,000 (80). Reconstruction of overcrossing, Hamden, Conn., $20,000 (20). Reconstruction of overcrossing, Park St., Manchester, Conn., $30,000 (5). Reconstruction of subway, Hartford, Conn., $100,000 (15).

Important Work Undertaken: Buildings and tracks to serve Armour & Co., Providence, R. I., $282,625 (20). Track and signal changes, Orms St., Providence, R. I., $139,700 (2). Track and signal changes, Promenade St., Providence, R. I., $148,500 (2). Platforms and driveways for freight facilities, New York, N. Y., $190,000 (100). Replacing timber trestle with ballast deck steel span, Lyme, Conn., $125,000 (50). Reinforcing ballast deck trestles, 810 ft., Baychester, N. Y., $300,000 (100). Building, platforms and driveway, Boston, Mass., $185,000 (100). Loading shed, office building and service building to serve New England Transportation Company, Boston, Mass., $127,550 (100). Replacing timber trestle with two span deck plate girder, New Haven, Conn., $242,000 (50).

Norfolk & Western

Second Track: Petersburg, Va., to Camp Lee, 3.44 miles.

Third Track: Iaeger, W. Va., to Hull, 2.22 miles.

Grade Crossing Elimination: Overcrossings: Riverton, Va., $530,740 (100). Pearisburg, Va., $390,780 (60). Nolan, W. Va., $141,136 (100). Boyce, Va., $102,572 (60). Max Meadows, Va., $3,000 (100). Franklin Furnace, Ohio, $254,000 (75).

Subways: Waynesboro, Va., $178,403 (100). Cedar Bluff, Va., $43,150 (100). Batavia, Ohio, $215,020 (100).

Reconstruction of Existing Grade Separation Structures: Widening of subway, Petersburg, Va., $37,460 (100). Widening of subway, Narrows, Va., $52,071 (100).

Important Work Undertaken: Construction of warehouse, Norfolk, Va., $721,000 (100). Extension of yard, Roanoke, Va., $4,700,000 (70). Construction of water treating plant, tanks, etc., Bluefield, W. Va., $116,400 (100). Flood defense, Ironton, Ohio, $203,000 (90). Construction of ballast deck bridge, Kilby, Va., $127,200 (100). Record storage building, Roanoke, Va., $104,000 (100). Extension of 20 tracks, Portsmouth, Ohio, $325,000 (100). Construction of 3.80 miles spur up Bens Creek, Gilbert, W. Va., $188,000 (75). Construction of 3.75 miles spur, Nolan, W. Va., into Ky., $500,000 (60). Extension of roundhouse, construction of shop buildings and facilities, Roanoke, Va., $270,750 (5). West bound classification yard, Portsmouth, Ohio, $655,000 (85). Revolving gantry crane, Sewalls Point, Norfolk, Va., $100,000 (100).

Northern Pacific

Grade Crossing Elimination: Overcrossings: Forest St., St. Paul, Minn., $32,000 (100). Sterling, N. D., $75,000 (100). Manhattan, Mont., $78,000 (100). Union Gap, Wash., $213,500 (100). Castle Rock, Wash., $120,600 (100).

Subways: Mandan, N. D., $176,356 (60). Troy, Idaho, $25,000 (100). Post Falls, Idaho, $30,000 (100).

Important Work Undertaken: Frame enginehouse with machine bay, frame office, store building and concrete cinder pit, Easton, Wash., $102,700 (100).

Oregon, Pacific & Eastern

Important Work Undertaken: Relocation of line, 7.12 miles, around Dorema flood-control reservoir, Lane County, Ore., $450,000 (20).

Pennsylvania

Grade Crossing Elimination: Three grade crossings abandoned and removed, Gap, Pa., (100).

Overcrossings: Heald St., Wilmington, Del., (55). Landover, Md., (55). Seaford, Del., (100). Florin, Pa., (25). Route 16, Columbia Center, Ohio, (100). Route 238, West Middlesex, Pa., (100). West Seneca, N. Y., (100). Route 117, Hogsett Cut, Uniontown, Pa., (100). Route 89, Garland, Pa., (100). Massillon, Ohio, (2). U. S. Route 40, Mulberry Grove, Ill., (5). U. S. Route 40, Stubblefield, Ill., (80). U. S. Route 31, Columbus, Ind., (100). Erie Ave. and Brotherton Rd., Cincinnati, Ohio, (20). Ninth St., Washington, D. C., (80). New York Ave., Washington, D. C. (5).

Subways: Catherine St., Middletown, Pa., (100). Mapleton, Pa., (100). Stanley, N. Y., (100). Elimination of grade crossings, Philadelphia Rd., Ohio, (100). Central Ave. and Brigham Rd., Dunkirk, N. Y., (95). State Highway 5600, Irving, N. Y., (100). Chili Ave., Rochester, N. Y., (100). State Highway 925, Jamison Rd., New York, N. Y., (100). Elimination of grade crossing, Enon, Pa., (100). East Union, Ohio, (30). Poth Rd., East Columbus, Ohio, (5). Middle River, Md., (100).

Relocation of Highway: Elimination of two grade crossings by construction of parallel road, Rowlandville, Md., (100). Elimination of five grade crossings by change of line, Dauphin, Pa., (20). Highway diversion to eliminate two crossings, Selma, Ohio, (25).

Reconstruction of Existing Grade Separation Structures: Reconstruction of 49th St. and Kingsessing ave. bridges, Philadelphia, Pa., (100). Reconstruction of Route 77 subway bridge, Morado, Pa., (100). Reconstruction of Route 9218, overcrossing, Ebenezer, N. Y., (100). Reconstruction of Route 47, subway bridge, Duncansville, Pa., (100).

Important Work Undertaken: Erection of building to house machinery for laundry, Long Island City, N. Y., (30). Extension of pier, Jersey City, N. J., (90). Rebuilding bulkhead, Greenville yard, Jersey City, N. J., (30). Construction of holding tracks, Newark, N. J., (100). Replacement of timber trestle, Jersey City, N. J., (100). Construction of additional tracks to support yard operations, Linden, N. J. (100). Construction of additional tracks for storage, South Amboy, N. Y., (20). Changing interlocking plant from electro-mechanical to electro-pneumatic and building new tower, Metuchen, N. J., (100). Changing interlocking plant from electro-mechanical to electro-pneumatic, building new tower, Morrisville, Pa., (100). Alterations to ferry and passenger station, Exchange Place, Jersey City, N. J., (100). New restaurant in passenger station, Newark, N. J., (20). Changes in Long Island ticket office, New York (25). Three new escalators, Pennsylvania station, New York, N. Y., (40). Relocation of tracks account of Municipal airport, Philadelphia, Pa., (100). Philadelphia terminal improvements, Philadelphia, Pa., (89). Facilities for Municipal pier, Philadelphia, Pa., (40). New connection between Penrose Ave. yard and Girard Pt. yard and rearrangement of tracks at south and north ends of Penrose Ave. yard, Philadelphia, Pa., (75). Installation of sprinkler fire protection systems, Wilmington, Del., (100). Mail handling facilities, Washington, D. C., (100). Extension of enginehouse, Enola, Pa., (100). New coaling station, Enola, Pa., (100). Extension of tracks to hold 125 cars, Enola, Pa., (100). Reduction of curve on wye and installation of electro-pneumatic switches, Rockville, Pa., (10). Extension of Plum Creek branch to connect with Unity railways, Unity, Pa., (2). Revision of alignment to eliminate reverse curve, Garfield, Ohio, (99). Construction of industrial siding to serve Wright Aeronautical Corporation, Reading, Ohio, (100). Construction of track 4 miles long from Boyd to Powder Mill Property, Charlestown, Ind., (100). Extension of tracks and reduction of curve, Columbus, Ohio, (100). Repairing and reconditioning of existing buildings, etc., Chicago, Ill., (100). Repairing and reconditioning of office and freight house facilities, including relocating and reconditioning of tracks, Halsted street, Chicago, Ill., (100).

(Long Island) Overcrossings: Elimination of 40 grade crossings, and construction of nine stations and platforms, Rockaway Beach, L. I., N. Y., (90). Elimination of grade crossing at 51st Ave., Long Island, N. Y., (25). Elimination of three grade crossings, Hempstead, L. I., N. Y., (40). Elevation of track to eliminate 12 grade crossings, Rosedale, L. I., N. Y., (2). Mineola, N. Y., (15).

Subway: Elimination of 21 grade crossings, Atlantic Ave., Brooklyn, N. Y., (75).

Pennsylvania-Reading Seashore Lines

Grade Crossing Elimination: Overcrossings: South Dennis, N. J., (100). Franklin Ave., West Berlin, N. J., (100). Elimination of two grade crossings and construction of one pedestrian overcrossing, Berlin, N. J., (100).

Pere Marquette

Important Work Undertaken: Construction of engine terminal, St. Thomas, Ont., $432,000 (85).

Reading

Grade Crossing Elimination: Overcrossings: Elimination of grade crossing by the construction of viaduct, including relocation and improvement of State Highway 443, Chapman, Pa., $415,171 (100). Elimination of grade crossing by construction of viaduct, including relocation and improvement of State Highway 149, Avon, Pa., $466,314 (75).

St. Louis-San Francisco

Grade Crossing Elimination: Overcrossings: U. S. Route 43, Demopolis, Ala., $25,431 (100). State Highway 7, Holly Springs, Miss., $76,000 (100). U. S. Route 60, Wyandotte, Okla., $150,000 (25). U. S. Route 77, Carrollton, Tex., $250,000 (25).

Subways: U. S. Route 75, Henryetta, Okla., $85,000 (100). U. S. Route 61, Turrell, Ark., $144,200 (100). U. S. Route 60, Republic, Mo., $88,000 (100).

St. Louis Southwestern

Grade Crossing Elimination: Overcrossing: Carrollton, Tex., joint with Rock Island, $250,000 (70).

Subway: Turney St., Dallas, Tex., $255,000 (100).

Relocation of Highway: Garland City, Ark., $60,000 (100).

Savannah & Atlanta

Grade Crossing Elimination: Overcrossing: Ogeechee St., Sylvania, Ga., $125,000 (100).

Seaboard Air Line

Grade Crossing Elimination: Overcrossings: West of Tallahassee, Fla., (100). Okeechobee, Fla., (50). Wildwood, Fla., (25). Winter Haven, Fla., (30).

Subways: Wyatts, N. C., (60). Darlington, S. C., (100).

Important Work Undertaken: Construction of second track from Chesapeake & Ohio overcrossing to Brown St., including reconstruction of existing viaduct, Richmond, Va., $873,000 (75). Construction of additional track from South Yard, Va., to Bellwood, 2.8 miles, including storage tracks at South Richmond, South Richmond, Va., to Bellwood, $156,000 (100). Extension of boiler shop and storehouse, construction of new flue shop and new drainage system together with additional machinery and equipment, West Jacksonville, Fla., $274,000 (75).

Southern

Grade Crossing Elimination: Overcrossings: Riverton, Va., $183,500 (100). Lyman, S. C., $36,500 (100). Munford, Ala., $24,500 (90). St. Joseph street, Mobile, Ala., $105,000 (100). Baldwin, Ga., $55,000 (100). Centerville, Ill., (100). Collierville, Tenn., $75,000 (90). Lenoir City, Tenn., (100). Western ave., Knoxville, Tenn., $400,000 (25). Jefferson City, Tenn., (100).

Subway: Barboursville, Va., $60,000 (100). Garner, N. C., $85,000 (15). Kernersville, N. C., $75,000 (25). Courtenay, S. C., $94,700 (90). E. Spartanburg, S. C., $42,800 (25). Pacolet, S. C., $65,000 (40). Jeffersontown, Ky., $70,000 (100).

Important Work Undertaken: Elimination of triple deck frame trestle by installation of two deck girders, Cordova, Ala., $119,000 (25).

(New Orleans & Northeastern) Overcrossing: Wautubbee, Miss., (90).

Subways: Hattiesburg, Miss., $36,300 (100). Downman Rd., New Orleans, La., $278,000 (5). St. Bernard St., New Orleans, La., $203,000 (25).

(Georgia Southern & Florida) Overcrossing: Sofkee, Ga., $44,200 (100).

Southern Pacific

Second Track: Brooklyn, Ore., to E. Portland, 1.35 miles.

Fourth Track: W. Oakland, Cal., to 16th St. Oakland, 0.31 miles.

Grade Crossing Elimination: Overcrossings: Haskell, Ore., $71,945 (100). Mesa, Ariz., $134,735 (100). Davies, Ore., $37,500 (100). Figueroa St., Los Angeles, Cal., $913,000 (60). Widening of overcrossing, Woolsey, Nev., $25,000 (100).

Subways: Davis, Cal., $230,000 (100). Burbank, Cal., $250,000 (70). Strassel, Ore., $32,000 (100). Tigard, Ore., $28,645 (100). Benson, Ariz., $153,304 (95). Remodeling of subway, Lowell, Ariz., $20,000 (85).

Relocation of Highway: Sunol, Cal., $160,000 (90).

Important Work Undertaken: Installation of water softening plants at nine locations, $101,000 (45). Construction of concrete sea wall to prevent erosion by ocean along Coast Line, San Francisco, Cal., to Los Angeles,

$288,000 (55). Extension of 111 sidings, located in the Cascade mountains, and the Sierra Nevadas and in the single track territory west of Tucson, Ariz., $1,677,000 (35). Construction of open deck single track bridge, Lathrop, Cal., $330,000 (5). Modernization and enlargement of building, including rearrangement of tracks and construction of pedestrian subways, station platform and curbs, Tucson, Ariz., $200,000 (100). Construction of new station, rearrangement of tracks, installation of station platform and curbs, Salinas, Cal., $142,000 (100). Modernization of station, construction of platform and curbs, Bakersfield, Cal., $72,000 (100). Extension of roundhouse over four previous outside pits and installation of two additional outside pits, Los Angeles, Cal., $110,000 (100). Extension of roundhouse and construction of four additional engine pits, Eugene, Ore., $137,000 (80). Replacement of table, extension of two pits, Tucson, Ariz., $83,000 (50). Replacement of table, Bayshore, Cal., $60,000 (100). Replacement of turn table, Tracy, Cal., $44,000 (100). Construction of additional mechanical facilities, machine shop extension, blacksmith and boiler shop, wheel lathe building, additional wheel drop pit, additional engine lathe, 100-ton hydraulic press, air operated jacks and miscellaneous equipment, West Oakland, Cal., $102,000 (90).

New Line Under Construction: Redding, Cal., to Delta, 30.09 miles.

Southern Pacific (Lines in Texas and Louisiana)

Grade Crossing Elimination: Overcrossings: Avondale, La., $194,000 (100). Cuero, Tex., $80,000 (65). Elgin, Tex., $131,000 (95).

Subways: Flatonia, Tex., $100,000 (80). Burton, Tex., $85,000 (100).

Relocation of Highway: Giddings, Tex., $82,000 (100). Mexia, Tex., $94,000 (100). Elgin, Tex., $135,000 (25).

Important Work Undertaken: Construction of single track bridge and approaches, including new depot facilities, Berwick Bay, La., and Morgan City, $250,000 (50). Construction of single track bridge over Wax Lake outlet, Calumet, La., $1,100,000 (100). Construction of double track swing bridge over Charenton drainage and navigation canal, Baldwin, La., $500,000 (100).

Spokane, Portland & Seattle

Grade Crossing Elimination: Overcrossing: Reinforcing of concrete overcrossing, Davies, Ore., $65,000 (100).

New Line Under Construction: Beaverton, Ore., and Greenburg, 0.47 miles.

Strouds Creek & Muddlety

First Track: Delphi, W. Va., to Ticoal, 3.96 miles.

Tennessee Central

Grade Crossing Elimination: Subway: Woodlawn Drive, Nashville, Tenn., $29,000 (100).

Terminal R. R. Ass'n of St. Louis

Second Track: Monsanto Village, Ill., 0.50 miles.

Texas & Pacific

Grade Crossing Elimination: Overcrossing: Avondale, La., $300,000 (100).

Subways: Terrell, Tex., $199,000 (50). Colorado, Tex., $88,000 (100). Benbrook, Tex., $7,500 (100).

Important Work Undertaken: Construction of passenger station and train shed, Shreveport, La., $200,000 (100).

Texas Pacific-Missouri Pacific Terminal of New Orleans

Important Work Undertaken: Yard tracks and car repair facilities, Avondale, La., $421,670 (15). Rearrangement of yard and construction of shop, New Orleans, La., $345,500 (5).

Union Pacific

Grade Crossing Elimination: Overcrossings: Elm Street, Hastings, Neb., $90,000 (100). U. S. Route 31, Elkhorn, Neb., $145,422 (35). U. S. Route 91, Glendale, Nev., $25,300 (100). Aliso St., Los Angeles, Cal., $3,650,000 (90). Boise Airport Rd., Shafer, Idaho, $15,000 (100). U. S. Route 30, Standfield, Ore., $10,000 (60). Union Gap, Wash., $213,508 (100).

Subways: Mountain Home, Wyo., $10,000 (100). Sand Creek Junction, Colo., $175,000 (60). State Route 3, Rahm, Wash., $17,990 (100). Curry, Idaho, $75,000 (10). Main St., Nyssa, Ore., $190,000 (100).

Important Work Undertaken: Construction of trackage and roadway for team and yard tracks in connection with Food Terminal on Public Levee, Kansas City, Kan., $605,800 (70). Purchase of land and construction of warehouse and garage, Denver, Colo., $110,000 (100). Purchase of land and construction of buildings and platforms, Denver, Colo., $365,600 (65). Construction of wood working mill building, wheel and tank shop, grease house with basement including paving around buildings, outside pipe lines, etc., Cheyenne, Wyo., $446,600 (10). Construction of two warehouses, Denver, Colo., $210,100 (100). Acquired site and construction of barrel fuel oil tank, trackage with loading facilities, building of steam plant for heating oil and installation of electric transmission lines, Rieth, Ore., $245,800 (100). Additional yard tracks, mechanical facilities, office building and various platforms, Council Bluffs, Iowa, $221,000 (100). Enlargement of enginehouse, new turntable and additional yard tracks, Ogden, Utah, $234,000 (100). Additional yard tracks, office and other buildings, Albania, Ore., $128,000 (100). Additional tracks, engine-sanding facilities and yard buildings, East yard, Los Angeles, Cal., $187,000 (100).

Virginian

Grade Crossing Elimination: Overcrossing: Route 58, Virginia Beach, Va., $173,000 (80).

New Line Under Construction: Cub City, W. Va., to Coal Mountain, 7.5 miles.

Wabash

Grade Crossing Elimination: Subways: Skinker Blvd., St. Louis, Mo., $400,000 (100). Monroe St., Decatur, Ill., $225,000 (75). Chase Rd., French Landing, Mich., $250,000 (10). State Highway 51 Gary, Ind., $60,000 (10).

Reconstruction of Existing Grade Separation Structures: Subway, Mannheim Rd., Orland Park, Ill., $100,000 (100). Overcrossing, Natural Bridge Rd., St. Louis, Mo., $80,000 (15).

Western Maryland

Grade Crossing Elimination: Overcrossing: Norton, W. Va., joint with Baltimore & Ohio. (To be completed in 1942).

Relocation of Highway: Relocation of three miles of main track to eliminate two grade crossings on Lincoln Highway, Brush Run, Guldens, Pa., (100).

Important Work Undertaken: Construction of 6-stall roundhouse, including office, machine shop, air compressor room and 110 ft. concrete inspection pit, Port Covington, Baltimore, Md., $110,000 (90).

Western Pacific

Grade Crossing Elimination: Overcrossing: Adeline St., Oakland, Cal., $250,000 (5).

Subway: Reinforcement of concrete subway, Sunol, Cal., $200,000 (100).

Wheeling & Lake Erie

Grade Crossing Elimination: Subway: State Highway 94, Kent, Ohio, $82,891 (100).

New Line Under Construction: Massillon, Ohio, 0.83 mile.

Railway Construction in Canada

Canadian National

First Track: Line revision, Kakabeka Falls, Ont., 0.97 miles. New connection with Canadian Pacific near Red Deer Junction, Alberta, 0.13 miles.

Grade Crossing Elimination: Overcrossings: Bala Sd., Ont. (100).

Subways: Route 2, St. Hilaire, Que. (100), St. Anne de Bellevue Highway Dorval, Que. (100) St. Anne, Laframboise and Bourdages sts., St. Hyacinthe, Que. (100).

Reconstruction of Existing Grade Separation Structures: Rebuilding and strengthening of overcrossing, Dunnville Sd., Ont. (100). Rebuilding of Coldstream highway bridge, Vernon, B. C. (To be completed in 1942).

Important Work Undertaken: Construction of new engine terminal, Fairview, N. S. (100). Construction of new "E" freight yard, Truro, N. S. (100). Construction of additional sidings, rearrangement of switching leads, and new highway bridge across yard, Truro, N. S. (100). New storage yard, Fairview-Richmond, N. S. (100). Locomotive erecting shop, Moncton, N. B. (to be completed in 1942). Alterations and extensions to freight yard and improvement to approaches to east end of yard, Moncton, N. B. (to be completed in 1942). Construction of new yard tracks, and extension of passing siding, Napadogan, N. B. (100). Conversion of car ferry from coal to oil burning, S. S. Prince Edward Island. Additional yard tracks, Joffre, Que. (100). Storage yard tracks, Point St. Charles, Que. (to be completed in 1942). Locomotive steaming up shed, Point St. Charles, Que. (to be completed in 1942). New car repair yard, Turcot, Que. (to be completed in 1942). Yard extension Turcot, Que. (to be completed in 1942). New terminal facilities, Montreal, Que. New office building, Portage Ave. and Main St., Winnipeg, Man. Rebuilding of bridge over Kaministiqua River, Kashabowie subdivision, Man. (100).

Canadian Pacific

Important Work Undertaken: Extension to tender shop, Weston, Man., $116,000 (100). Extension of machine shop to roundhouse, Alyth, Alta., $128,000 (100). Addition to tender shop, Ogden, Alta., $174,000 (100).

Newfoundland

Important Work Undertaken: Repairing and replacement of main line bridges, $150,000 (75).

Toronto Hamilton & Buffalo

Important Work Undertaken: Reconstruction of overcrossing, Pearl St., Hamilton, Ont., $18,000 (100).

Railway Construction in Mexico

Department of Communications

First Track: Calzontzin, Mich., to Apalzingan, 78.9 miles.

New Line Under Survey: Creel, Chi., to San Pedro, Sin.

Southern Pacific of Mexico

Grade Crossing Elimination: Overcrossings: Kilometer 1597, Kilometer 1169 and Kilometer 1488.

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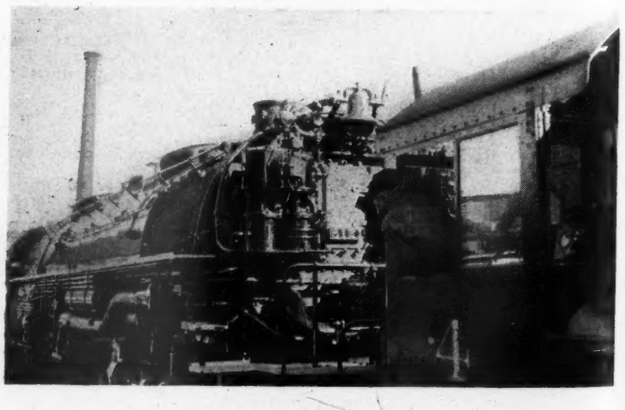


Terrier Pulls Horse

A plant Diesel-electric switcher of the American Locomotive Company drills out a new articulated steam locomotive for the Northern Pacific.

Impressive Freight Car-Buying Program Witnessed in 1941

Material shortages kept new car deliveries 50 per cent below schedule—Unfilled orders mounted

By Arthur J. McGinnis

Associate Editor

SPURRED during the year by rising estimates of prospective car loadings and the nation's rapidly mounting war orders, chiefly in the heavy goods category requiring rail haulage, the railroads carried through most of 1941 the heavy wave of new freight car equipment buying started in June of 1940. Only in the later months of the year when the backlog of unfilled orders had risen to more than a full year's production at the rate of deliveries being maintained was the pace of new buying necessarily slowed.

Total orders placed during the year for domestic service reached 118,371 cars, an increase of 50,519 cars or 74 per cent as compared with 1940 purchases and the largest number ordered in any year since 1924. Indeed, in only three years since prior to the last war, 1913, has a greater number been placed. These orders followed 58,584 cars purchased during the final seven months of 1940, making a total of 176,955 cars ordered during the 19 months ended December 31, 1941, or a monthly average of more than 9,000 cars sustained for one of the longest periods of concentrated buying in recent times. Generally, these orders were well spaced throughout the period.

Of the total of 118,371 new cars purchased in 1941, 111,028 were ordered by railroads, 6,095 by industrial companies and private car lines, and 1,248 by the United States War and Navy Departments. Railroad orders were divided 34,532 cars, or 31 per cent, to company shops and 76,496, or 69 per cent, to contract car builders.

A division of total orders placed as between company shops and contract car builders is shown in Table I.

Most of the buying during the year was of box cars, this type of car accounting for 59 per cent of the railroad orders and 56 per cent of total orders. Large numbers of hopper and gondola cars were also sought by the carriers. Private car lines let substantial orders for refrigerator and tank cars, and the United States Government acquired chiefly tank cars.

A further analysis of 1941 domestic freight car orders placed by railroads, industrial companies and private car lines, and the government according to the class of car

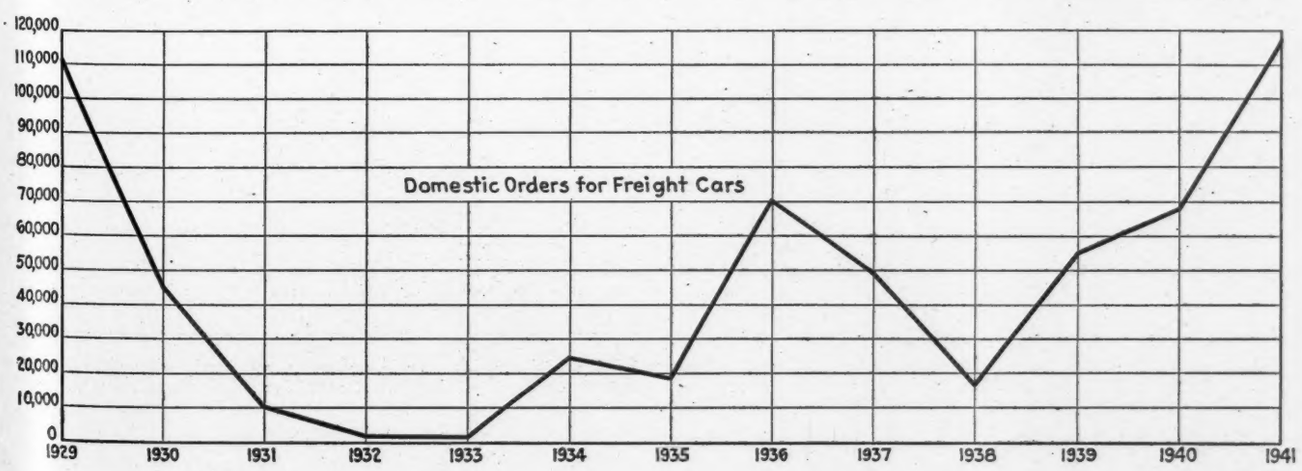
Table I—Freight Car Orders for Domestic Service in 1941

Builder	Railroads	Industrial and Private Car Cos.	U. S. Gov't. Depts.	Total	Per Cent of Total
Company shops	34,532	2,326	....	36,858	31
Contract Car-Builders	76,496	3,769	1,248	81,513	69
Total	111,028	6,095	1,248	118,371	100

Table II—Domestic Car Orders by Types, and by Class of Buyers

Type of Freight Car Ordered	1941 Railroads	1941 Industrial and Private Car Cos.	1941 U. S. Govt. Depts.	1941 Total	Total 1940	Increase, 1941 over 1940
Box	65,586	331	140	66,057	36,897	29,160
Hopper	24,359	627	...	24,986	16,690	8,296
Gondola	15,451	530	...	15,981	9,492	6,489
Flat	2,986	233	134	3,353	932	2,421
Refrigerator	200	2,650	...	2,850	1,285	1,565
Tank	450	1,427	873	2,750	1,631	1,119
Stock	300	...	...	300	338	(d)38
Caboose	1,317	3	...	1,320	511	809
Miscellaneous	379	294	101	774	76	698
Total	111,028	6,095	1,248	118,371	67,852	50,519

(d) decrease.



ordered, together with a comparison with 1940 orders, is shown in Table II.

Notable freight car orders placed by railroads, with the predominant type shown in parenthesis, included the following: 4,175 cars (3,500 box) by the Atchison, Topeka & Santa Fe; 4,550 (2,250 box, 1,150 hopper, 1,050 gondola) by the Baltimore & Ohio; 4,095 (2,000 box, 2,000 hopper) by the Chesapeake & Ohio; 4,325 (2,875 box, 1,000 gondola) by the Chicago & North Western; 4,225 (2,725 box) by the Chicago, Burlington & Quincy; 4,205 (2,100 box, 1,842 hopper) by the Missouri Pacific; 5,024 (4,000 box, 1,000 gondola) by the New York Central; 10,770 (4,000 box, 3,000 hopper, 3,500 gondola) by the Pennsylvania; 4,037 (3,411 box) by the Southern; and 6,134 (4,350 box) by the Southern Pacific.

Table III—Total Orders For Freight Cars 1929-1941

Year	Domestic†	U. S. Export	Canadian	Total
1941	118,371	5,721	7,578*	131,670
1940	67,852	1,774	936	70,562
1939	54,441	1,476	7,007*	62,924
1938	16,647	442	4,902	21,991
1937	49,331	1,369	7,397	58,097
1936	70,842	526	271	71,639
1935	18,708	110	2,421	21,239
1934	24,610	1,323	12	25,945
1933	1,686	132	75	1,893
1932	1,968	77	501	2,546
1931	10,826	151	3,807	14,784
1930	45,731	1,200	1,936	48,867
1929	111,321	3,023	9,899	124,243

* (Inc. Export).
† In certain instances domestic orders placed in December are not reported until following year. Statistics for years 1929-1940 are adjusted to eliminate this overlap.

Leading purchases by industrial companies included 100 flat cars by the Arundel Corporation, 411 cars of various types by the Bethlehem Steel Company and 98 gondola and 12 air-dump cars by the National Tube Company. The larger orders placed by private car lines included 600 refrigerator cars by the Burlington Refrigerator Express, 212 tank and 150 box cars by the E. I. DuPont de Nemours Co., 500 refrigerator cars by the Fruit Growers' Express, 1,000 refrigerator cars by the Pacific Fruit Express, 410 tank, 86 hopper and 17 flat cars by Shippers Car Line, 241 hopper, 20 gondola and 20 flat cars by the Tennessee Coal, Iron & R. R. Co., and 400 refrigerator cars by the Western Fruit Express. The United States Navy Department purchased 290 cars, including 162 tank, 96 flat and 32 box, and the United States War Department 958 cars, including 711 tank, 108 box, 38 flat, 68 ammunition, 29 fire control and 4 air-dump cars.

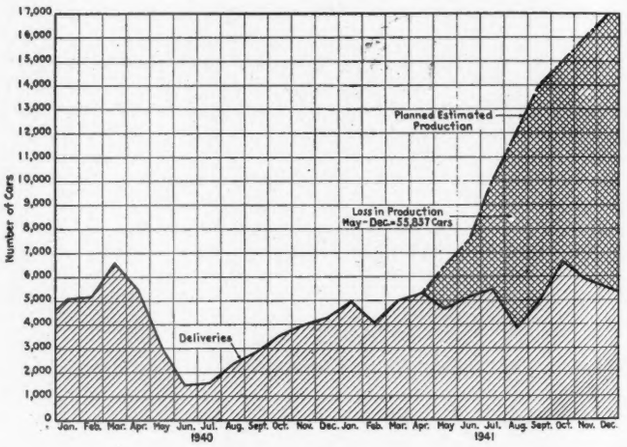
Other large domestic orders are shown in detail in the appended tables which give the number, class, capacity, length, construction, weight, date of order, date of delivery and builder of the cars.

Foreign purchases placed with American builders totaled 5,721 cars, an increase of 3,947 cars or more than three times similar 1940 orders and the largest number placed in any year in the 1929-1941, inclusive, cycle, current base period of these comparisons. The orders according to classes of cars purchased were divided as follows: 1,550 box, 250 hopper, 476 gondola, 2,850 flat, 202 air-dump, 91 tank, 100 banana, 192 cane and 10 miscellaneous cars.

Of particular interest and chiefly accountable for the increase over 1940 was the large number of cars purchased by the government for export under the lease-lend act. Thus the War Department ordered 115 gondola and 121 flat cars for Chinese defense and the Treasury Department 2,400 flat cars. The War Department also had pending in the market at the close of the year, for export to Iran and the Near East, a total of 4,916 cars comprising the following: 2,000 40-ton, 8-wheel box; 900 40-ton, 8-wheel high-side gondola; 600 40-ton, 8-wheel low-side gondola; 350 50-ton, 8-wheel flat; 1,000 20-ton, 4-wheel box, and 66 20-ton, 4-wheel caboose. Other leading export orders placed in the United States market during 1941 included 550 box cars by the Argentine State Railways, 1,000 box cars by the National Railways of Mexico, 250 gondola and 100 flat cars by the Royal State Railways of Thailand, 100 banana cars by the United Fruit Company and 190 air-dump cars by the U. S. S. R.

Canadian orders numbered 7,578 cars, divided 5,488 for local service and 2,090 for export. Purchases by the Canadian National and Canadian Pacific comprised the bulk of local orders, 4,025 cars being ordered by the former and 1,025 by the latter as compared with 165 and 500 cars respectively ordered by these companies in 1940. Canadian local orders were divided 2,700 box, 946 hopper, 975 gondola, 512 flat, 200 refrigerator, 93 tank, 25 caboose and 37 miscellaneous cars. Chief Canadian export order was for 2,000 bogie-wagons placed by the South African Railways.

A comparison of 1941 domestic, export and Canadian orders with the preceding years, 1929-1941, inclusive, is set forth in Table III.



Freight Car Deliveries of Contract Car Builders Compared with Planned Production

Freight Car Building Program Well Below Schedule

Freight cars built in the United States for domestic service during the year 1941 totaled 79,396, an increase of 26,467 or 50 per cent as compared with 1940 and the largest volume turned out in any year since the 82,240 delivered in 1929. Of the 79,396 built, 61,500 or 77.5 per cent were constructed by car builders, 17,485 or

Table IV—Freight Cars Built 1929-1941

Year	Domestic	U. S. Export	Canadian	Total
1941	79,396	2,312	5,135 (Inc. export)	86,843
1940	52,929	1,622	2,052	56,603
1939	24,876	181	2,206 (Inc. export)	27,263
1938	17,473	549	5,115 (Inc. export)	23,137
1937	75,003	1,121	6,595	82,719
1936	45,822	493	1,800	48,115
1935	6,933	888	801	8,622
1934	25,176	151	....	25,327
1933	2,160	151	550	2,861
1932	3,254	82	....	3,336
1931	13,205	409	4,633	18,247
1930	75,188	1,909	6,923	84,020
1929	82,240	3,168	8,557	93,965

22.0 per cent by railroad companies' shops and 411 by private car companies' shops. (December deliveries included in these figures are partially estimated.) The number of cars built in the United States for export also rose to the largest volume since 1929, totaling 2,312, an increase of 690 or 43 per cent over similar 1940 construction. Canadian deliveries numbered 5,135 cars, including 3,045 built for local service and 2,090 for export, an increase of 3,083 over total Canadian production in 1940. Comparisons with other years in the 1929-1941 cycle are set forth in Table IV.

As compared with production planned for 1941, however, domestic deliveries of 79,396 cars fell far short of expectations. Early in the year, the Association of American Railroads had recommended to the chief executives of the railroads that the carriers increase the number of freight cars owned to a total of 1,700,000 by October 1, 1941, and to 1,800,000 by October 1, 1942, as an important part of their contribution to the national defense effort. These recommendations were based on estimates of Association experts and economists of the Office of Production Management. Promises were made that the government would give prime consideration to the necessity of providing materials for such an equipment-building program and a canvass was made of car-building plants to determine the volume of deliveries that could be expected.

For their part, the contract car builders laid plans to deliver 6,500 cars in May and, thereafter, gradually to expand operations to 17,000 cars to be delivered in December, by which time operations would have reached an annual delivery rate of 204,000 cars. These plans depended chiefly on the following factors: One, that new orders would generally be for cars of a standard design and placed in volume large enough to permit efficient production planning; two, that the car building industry would be able successfully to increase its trained manpower; and three, that the industry would be placed high enough on the government's priority list to get the materials necessary for the purpose.

Actually, the car building industry received an A-3 priorities rating, supposedly to expedite steel purchases, but higher ratings left little available. Plagued by a shortage of materials, contract car builders produced 42,163 cars during the eight-month period, May-December, instead of 98,000 as planned, an operating rate of 43 per cent of expectations and a loss in productive capacity during that period of 55,837 cars.

Unfilled orders on car builders' books reached a peak of 70,330 cars on July 31, and, unable to secure delivery of cars already on order, many carriers postponed new purchasing pending the availability of earlier delivery dates. (Domestic freight car deliveries, planned estimated production and backlog of unfilled orders of contract car builders for each month of the years 1940 and 1941 are set forth in Table V and an accompanying chart. Deliveries by railroad companies' shops have been excluded due to the unavailability of monthly records of some company shop plants.)

On October 1, 1941, railroad ownership totaled about 1,676,000 cars, 24,000 fewer than planned. To reach 1,800,000 cars by October 1, 1942, therefore, it is necessary that the 1942 program deliver 154,000 cars, that is, make up the 24,000 car deficit of 1941, provide an increase of 100,000 cars, and replace an estimated 30,000 cars to be retired during the period. This will necessitate average monthly deliveries of 12,800 cars. Actually, still handicapped by a shortage of materials, principally steel, contract car builders during October, November and December delivered an average of 6,000 cars per month, at which rate of operations, if continued, the current program would be disastrously short of its goal on October 1, 1942. Fortunately, however, there were good reasons to believe, at the end of the year, that additional quantities of steel will be made available for car building purposes, in the event of which, it is expected that orders totaling many thousands of cars will be quickly placed by the nation's carriers.

Production figures as used in the preceding review are not comparable with figures on the number of cars *installed* as reported in statistics issued by the A. A. R. as these latter include, in addition to new units acquired, cars rebuilt and re-written into property accounts; used units acquired; leased units returned to service; and new and used units leased from others.

The appended tables contain a detailed statement of domestic orders for new freight cars, or those having new bodies, placed during 1941 by railroads; industrial concerns; and the United States government; also those placed for export and in Canada. The list of orders was compiled from information furnished to the *Railway Age* by the railroads, private car lines, United States government departments and other purchasers of cars in response to requests for this information. Data thus compiled were then checked against lists of orders supplied by the car builders, and also against weekly reports of orders appearing in the Equipment & Supplies column of the *Railway Age*. Production figures were secured in response to requests to freight car builders. As in former years, the *Railway Age* is especially indebted to the American Railway Car Institute for its assistance in making available reports of the companies affiliated with that organization.

The *Railway Age* cannot guarantee the listing of orders to be complete or the statistical accuracy of the production figures. However, it is believed that such omissions as occur will be found to be relatively small and unimportant, and will not vitiate the value of the figures, particularly with respect to comparisons with preceding years.

Table V—Domestic Freight Car Deliveries Compared with Planned Production

Data Covers Contract Car Builders Only

Years 1940 and 1941

	Deliveries				
1940	Number	Per Cent of Rated Operating Capacity (A)	Planned Estimated Production (B)	Loss in Production (Planned Production Less Deliveries)	Backlog of Unfilled Orders
January	5,084	35.6	....	....	20,229
February	5,142	36.0	....	....	15,253
March	6,548	45.8	....	....	10,109
April	5,400	37.8	....	....	5,501
May	3,061	21.4	....	....	4,752
June	1,478	10.3	....	....	8,603
July	1,543	10.8	....	....	12,826
August	2,356	16.5	....	....	14,500
September	2,844	19.9	....	....	20,746
October	3,586	25.1	....	....	25,947
November	3,981	27.8	....	....	30,362
December	4,293	30.0	....	....	34,205
Total, 1940	45,316	26.4	....	....	
1941					
January	4,993	34.9	....	....	34,384
February	4,057	28.4	....	....	32,991
March	4,987	34.9	....	....	37,359
April	5,300	37.1	....	....	44,707
May	4,670	32.7	6,500	1,830	59,104
June	5,130	35.2	7,500	2,370	69,355
July	5,467	38.2	10,000	4,533	70,330
August	3,856	27.0	12,000	8,144	69,307
September	5,044	35.3	14,000	8,956	65,230
October	6,620	46.2	15,000	8,380	57,193
November	5,984	41.8	16,000	10,016	54,142
December	5,392*	37.7	17,000	11,608	**
Total, 1941	61,500	35.8			

* Partially estimated.
** Not available at time of printing.
(A) Based upon monthly rated operating capacity for all builders of 14,300 cars.
(B) Based on carbuilders' plans for increased production effective May, 1941.

Freight Car Orders in 1941

For Service in the United States

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Akron, Canton & Youngstown, Northern Ohio	100	Hopper	100,000	33	0	Steel	42,000	June	Mar. '42	Bethlehem
	30	Gondola	100,000	41	6	Steel	41,000	June	December	Bethlehem
	15	Cov. Hopper	140,000	29	3	Steel	52,300	July	Mar. '42	Amer. Car & Fdry.
Alabama Great Southern	75	Cov. Hopper	140,000	29	3	Steel	51,700	May	Jan. '42	Greenville
Aliquippa & Southern	50	Gondola	200,000	38	2	Steel	58,000	February	Jan. '42	Company Shops
	50	Gondola	200,000	38	2	Steel	58,000	September	May '42	Company Shops
American Cyanamid	1	Tank	10,000g	..	..	....	.....	October	December	General American
American Gas & Elec. Co.	6	Transformer	180,000	40	0	Steel	54,400	March	September	Amer. Car & Fdy.
American Locomotive Co.	2	Flat	200,000	65	0	Steel	65,000	April	November	Amer. Car & Fdy.
American Refrigerator Transit Co.	150	Refrigerator	80,000	33	2¾	Steel Frames	53,600	February	Oct. '41	Company Shops
American Rolling Mill Co., Inc.	2	Air Dump	50 cu. yds.	42	2½	Steel	86,200	June	Jan. '42	Pressed Steel
	10	Gondola	100,000	..	..	Steel	.....	November	Mar. '42	Amer. Car & Fdy
American Steel & Wire Co.	65	Gondola	140,000	40	0	Steel	51,100	November	May '42	Magor
	8	Air Dump	30 cu. yds.	..	..	Steel	.....	1941	Jan. '42	Austin-Western
Ann Arbor	25	Hopper	110,000	33	0	Steel	.....	February	August	Company Shops
Ansul Chemical Co.	1	Tank	40,000	..	..	....	.....	August	Jan. '42	General American
Arundel Corp.	100	Flat	100,000	40	0	St. Underframe	38,500	June	November	Amer. Car & Fdy.
Atchison, Topeka & Santa Fe.	1,000	D. S. Box	100,000	40	6	Steel	45,400	March	Oct.-Nov.	Pullman-Standard
	200	Gondola	100,000	48	6	Steel	47,000	March	September	General American
	500	D. S. Auto	100,000	50	6	Steel	.....	April	Nov.-Dec.	Pullman-Standard
	200	Tank	140,000	..	..	Steel	62,000	June	Mar. '42	General American
	75	Cov. Hopper	140,000	29	3	Steel	53,000	June	Jan. '42	General American
	200	Caboose	60,000	..	..	St. Underframe	.....	August	Apr.-June '42	Company Shops
	2,000	D. S. Box	100,000	40	6	Steel	45,500	May	Dec.-Feb.' 42	Pullman-Standard
Atlanta & West Point	40	Box	100,000	40	6	Steel	44,700	May	Nov.-Dec.	Pullman-Standard
Atlantic Coast Line	100	Phosphate	140,000	35	9¾	Steel	50,700	April	Jan. '42	Bethlehem
	200	Gondola	100,000	41	6	Steel	43,800	April	December	Bethlehem
	300	D. S. Auto-Furn.	100,000	50	6	Steel	55,400	May	December	Mount Vernon
	800	D. S. Box	100,000	40	6	Steel	46,000	April	Mar. '42	Amer. Car & Fdy.
	830	D. S. Box	100,000	40	6	Steel	45,000	April	Dec.-Jan. '42	Pullman-Standard
	700	D. S. Auto-Box	100,000	40	6	Steel	51,600	May	Apr. '42	Amer. Car & Fdy.
Atmospheric Nitrogen Corp.	70	Tank	50,000	..	..	....	.....	August	Oct.-Feb. '42	General American
Badger & Sons Co., E. B.	5	Tank	7,000g	..	..	....	.....	August	Feb. '42	General American
	14	Tank	7,000g	..	..	....	.....	August	December	General American
	6	Tank	7,000g	..	..	....	.....	August	December	General American
Baltimore & Ohio	500	Gondola	140,000	52	6	Steel	55,900	February	September	Bethlehem
	50	Gondola	140,000	65	6	Steel	.....	April	September	Bethlehem
	150	Auto	100,000	50	6	Steel	58,700	March	Sept.-Oct.	Pullman-Standard
	50	Auto	100,000	50	6	Steel	60,400	March	Sept.-Oct.	Pullman-Standard
	50	Auto	100,000	50	6	Steel	63,800	March	Sept.-Oct.	Pullman-Standard
	1,000	Box	100,000	40	6	Steel	48,300	May	Nov.-Dec.	Pullman-Standard
	500	Gondola	140,000	52	6	Steel	55,400	February	July	Amer. Car & Fdy.
	150	Cov. Hopper	140,000	26	3⅝	Steel	50,200	March	October	Greenville
	1,000	Hopper	100,000	33	0	Steel	44,300	March	Sept.-Nov.	General American
	1,000	Box	100,000	40	6	Steel	47,500	February	August	Company Shops
	100	Caboose	.....	23	5½	Steel	40,000	April	...	Company Shops
Barrett Co.	50	Tank	10,000g	33	3¼	Steel	58,000	April	July	Amer. Car & Fdy.
	10	Tank	10,000g	..	..	....	.....	April	June-July	General American
Berwind-White Coal Mining Co.	110	Hopper	100,000	31	3	Steel	41,300	January	Sept.-Dec.	Company Shops
Bessemer & Lake Erie	428	Hopper	180,000	40	8	Steel	49,260	October	Jan.-Mar. '42	Pullman-Standard
	300	Gondola	100,000	46	0	Steel	46,600	November	Mar. '42	Greenville
	200	Gondola	110,000	46	0	Steel	48,500	October	June '42	Pressed Steel Car
Bethlehem Steel Co.	2	Flat	400,000	42	2	Steel	120,200	January	May	Company Shops
	4	Gondola	100,000	39	3¼	Steel	65,200	January	September	Company Shops
	14	Flat	200,000	34	0	Steel	94,500	February	August	Company Shops
	3	Gondola	100,000	36	0	Steel	49,400	March	August	Company Shops
	12	Flat	200,000	34	0	Steel	58,500	March	October	Company Shops
	3	Well	400,000	46	2	Steel	110,200	March	September	Company Shops
	220	Gondola	100,000	36	0	Steel	.....	April	Dec.-Jan. '42	Company Shops
	20	Flat	100,000	36	9	Steel	.....	April	Feb. '42	Company Shops
	50	Gondola	100,000	40	0	Steel	.....	May	Mar. '42	Company Shops
	1	Well	400,000	46	2	Steel	.....	June	December	Company Shops
	50	Coke	100,000	36	9¾	Steel	.....	July	December	Company Shops
	50	Gondola	140,000	52	6	Steel	.....	August	Mar. '42	Company Shops
	12	Flat	200,000	..	..	Steel	.....	November	Apr. '42	Company Shops
Bingham & Garfield	1	Caboose	60,000	19	0	Steel Frame	37,700	October	Jan. '42	Pac. Car & Fdy.
Birmingham Southern	100	Box	100,000	40	6	Steel	46,000	October	Apr.-June '42	Pullman-Standard
	100	Gondola	140,000	46	0	Steel	49,900	October	Apr.-June '42	Pullman-Standard
	10	Cov. Hopper	140,000	29	3	Steel	53,300	October	Mar. '42	Pullman-Standard
	10	Cov. Hopper	140,000	29	3	Steel	53,000	October	Feb. '42	General American
Boston & Maine	500	Gondola	100,000	41	6	Steel	43,700	June	Jan. '42	Bethlehem
	100	Hopper	100,000	33	0	Steel	40,000	June	December	Bethlehem
	200	S. S. Box	80,000	40	6	Steel	43,900	May	Mar. '42	Magor
	10	Caboose	.....	27	0	Steel	43,800	September	Apr.-June '42	Pullman-Standard
Buffalo-Elec. Chemical Co.	1	Tank	8,150g	24	9½	Aluminum	.....	October	Jan. '42	Amer. Car & Fdy.
Burlington Refrigerator Express	300	Refrigerator	77,000	40	0	Steel Frame	57,000	July	Jan.-June '42	Company Shops
	300	Refrigerator	80,000	39	11	Steel Frame	.....	December	1942	Company Shops
California Dispatch Line	3	Tank	6,000g	36	6½	Steel	57,500	March	July	Amer. Car & Fdy.
	2	Tank	8,000g	35	10¾	Steel	56,100	March	August	Amer. Car & Fdy.
	5	Tank	6,000g	30	1¾	Steel	49,000	March	August	Amer. Car & Fdy.
	9	Tank	6,000g	..	..	....	.....	March	Aug.-Oct.	General American
Carnegie-Illinois Steel Corp.	1	Ingot	400,000	37	0	Steel	97,000	June	December	Pressed Steel
	20	Air Dump	50 cu. yds.	42	0	Steel	83,400	November	Apr. '42	Pressed Steel
	1*	Tank	6,000g	..	..	Steel	.....	Dec. '40	May	General American
Central of Georgia	100	D. S. Box	100,000	40	6	Steel	45,900	April	Aug.-Sept.	Pullman-Standard
	100	D. S. Auto	100,000	40	6	Steel	48,000	April	Aug.-Sept.	Pullman-Standard
	25	Cov. Hopper	140,000	29	3	Steel	53,000	May	December	General American
	150	D. S. Auto	100,000	50	6	Steel	54,000	June	Mar. '42	Amer. Car & Fdy.
	50	D. S. Box	100,000	40	6	Steel	44,700	June	Jan.-Mar. '42	Pullman-Standard
Central of New Jersey	475	Hopper	110,000	31	0	Steel	43,000	March	December	Company Shops
	25	Cement	110,000	31	0	Steel	43,000	March	June	Company Shops
	500	Hopper	110,000	31	0	Steel	43,000	April	June '42	Company Shops
	50	Caboose	.....	32	0	Steel	41,700	April	Feb. '42	Company Shops
	1,000	Gondola	140,000	52	6	Steel	.....	July	July '42	Bethlehem
	50	Cov. Hopper	140,000	..	..	Steel	.....	October	Mar. '42	Amer. Car & Fdy.
Chesapeake & Ohio	250	S. S. Box	100,000	40	6	Steel Frame	45,300	January	October	Amer. Car & Fdy.
	250	S. S. Box	100,000	40	6	Steel Frame	43,400	January	August	Mount Vernon
	250	S. S. Box	100,000	40	6	Steel	43,800	January	May-June	General American
	250	S. S. Box	100,000	40	6	Steel	44,600	January	September	Pullman-Standard
	50	Flat	100,000	50	0	Steel	45,800	January	September	Bethlehem
	25	Flat	140,000	56	0	St. Underframe	65,650	February	July	Ralston
	10	Flat	250,000	56	0	Steel	101,000	February	Nov.-Dec.	Greenville
	6	Flat	250,000	52	8	Steel	107,400	February	December	Greenville

* 1940 totals have been adjusted to include these cars which were not reported last year.

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Chesapeake & Ohio (cont'd) ...	4	Flat	250,000	62	6	Steel	125,600	February	December	Greenville
	400	Hopper	100,000	33	0	Steel	41,800	March	October	Amer. Car & Fdy.
	300	Hopper	100,000	33	0	Steel	40,570	March	July	Pullman-Standard
	300	Hopper	100,000	33	0	Steel	40,300	March	Aug.-Sept.	General American
	1,000	Hopper	100,000	33	0	Steel	40,000	June	Mar. '42	Amer. Car & Fdy.
	1,000	S. S. Box	100,000	40	6	Steel	45,500	June	Jan.-Mar. '42	Pullman-Standard
Chicago & Eastern Illinois	500	Box	100,000	40	6	Steel	51,000	June	June-July '42	Mount Vernon
Chicago & North Western	200	Ore	140,000	21	1¾	Steel	39,800	January	August	Bethlehem
	250	Gondola	100,000	41	3	Steel	47,400	January	September	Bethlehem
	250	Ore	140,000	21	1¾	Steel	40,000	October	Apr. '42	Bethlehem
	500	Box	100,000	50	6	Steel	50,800	January	July-Sept.	Pullman-Standard
	500	Box	100,000	40	6	Steel	45,800	May	Oct.-Nov.	Pullman-Standard
	675	Box	100,000	40	6	Steel	45,800	July	Apr.-June '42	Pullman-Standard
	500	Box	100,000	40	6	Steel	46,800	May	Mar. '42	Amer. Car & Fdy.
	700	Box	100,000	40	6	Steel	46,800	July	May '42	Amer. Car & Fdy.
	750	Gondola	100,000	41	3	Steel	47,400	January	June-Aug.	General American
Chicago, Burlington & Quincy..	50	Box	100,000	50	6	Steel	57,700	May	1941	Company Shops
	2,000	Box	100,000	40	6	Steel	.....	May	1941-'42	Company Shops
	500	Box	100,000	50	6	Steel	.....	May	1942	Company Shops
	175	Auto	100,000	50	6	Steel	.....	May	1942	Company Shops
	50	Cov. Hopper	140,000	29	3	Steel	.....	May	1942	Company Shops
	100	M. T. Gondola	140,000	65	3	Steel	.....	May	1942	Company Shops
	250	Hopper	110,000	34	3	Steel	.....	May	1942	Company Shops
	400	Flat	100,000	53	6	Steel	.....	May	1942	Company Shops
	200	Stock	80,000	40	0	Steel Frame	.....	May	1942	Company Shops
	250	Ballast	140,000	40	8	Steel	.....	May	1942	Company Shops
	250	Ballast	140,000	40	8	Steel	56,100	January	July	Amer. Car & Fdy.
	25*	Box	100,000	50	6	Steel	57,700	Dec. '40	1941	Company Shops
	400*	Box	100,000	50	6	Steel	53,800	Dec. '40	1941	Company Shops
	1,000*	Box	100,000	40	6	Steel	46,400	Dec. '40	1941	Company Shops
	100*	Box	100,000	50	6	Steel	56,400	Dec. '40	1941	Company Shops
	225*	Auto	100,000	50	6	Steel	60,200	Dec. '40	1941	Company Shops
	200*	Hopper	110,000	34	3	Steel	38,500	Dec. '40	1941	Company Shops
Chicago Great Western	200	Merchandise	100,000	50	0	Steel	50,300	September	Jan.-Mar. '42	Pullman-Standard
Chicago, Indianapolis & Louisville	150	Box	100,000	40	6	Steel	44,600	March	October	Pullman-Standard
	60	Flat	100,000	53	6	Steel	47,000	March	August	Pullman-Standard
	300	Box	100,000	40	6	Steel	45,300	September	Apr.-June '42	Pullman-Standard
	10	Cov. Hopper	140,000	29	3	Steel	53,000	July	December	General American
Chicago, Milwaukee, St. Paul & Pacific	25	Caboose	60,000	28	0	Steel	39,400	February	August	Company Shops
	475	Box	100,000	50	6	Steel	48,500	February	November	Company Shops
	25	Merchandise	50,000	50	6	Steel	50,100	February	December	Company Shops
	500	Hopper	100,000	33	0	Steel	40,700	July	Apr. '42	Company Shops
	500	Auto	100,000	40	6	Steel	44,500	August	June '42	Company Shops
	1,000	Box	100,000	40	6	Steel	45,500	August	Nov. '42	Company Shops
	25	Caboose	60,000	28	0	Steel	39,400	November	Dec. '42	Company Shops
	5	Gondola	100,000	41	6	Steel	48,200	October	Apr. '42	Bethlehem
Chicago, Rock Island & Pacific..	25	Cov. Hopper	140,000	29	3	Steel	53,500	February	June	General American
	1,000	S. S. Box	110,000	40	6	Steel	46,200	April	November	Pressed Steel
	800	S. S. Box	110,000	40	6	Steel	46,200	May	Feb. '42	Pressed Steel
	200	Hopper	100,000	33	0	Steel	40,000	June	Jan. '42	Amer. Car & Fdy.
Chicago, St. Paul, Minneapolis & Omaha	700	Box	100,000	40	6	Steel	46,800	March	December	Amer. Car & Fdy.
	500	Box	100,000	40	6	Steel	45,000	July	Feb.-Mar. '42	General American
	8	Box	100,000	40	6	Steel	46,500	August	Jan. '42	General American
Cincinnati, New Orleans & Texas Pacific	25	Cov. Hopper	140,000	29	3	Steel	51,700	May	Jan. '42	Greenville
	2	Flat	180,000	40	7	Steel	70,400	May	October	Company Shops
Cities Service Def. Corp.	3	Tank	7,850g	31	3	Steel	45,700	October	Jan. '42	Amer. Car & Fdy.
	1	Tank	7,850g	..	..	Steel	.....	November	....	Amer. Car & Fdy.
Cities Service Oil Co.	2	Tank	10,500g	37	0	Steel	55,000	March	June	Amer. Car & Fdy.
	3	Tank	8,000g	..	..	....	.....	March	July	General American
	3	Tank	10,500g	..	..	....	.....	March	June	General American
Clinchfield	5	Cov. Hopper	140,000	29	3	Steel	52,800	June	September	Amer. Car & Fdy.
	7	Caboose	.....	28	5	Steel	50,000	June	Mar. '42	Amer. Car & Fdy.
Consolidated Chemical Industries	1	Tank	4,200g	27	0½	Steel	48,700	June	December	Amer. Car & Fdy.
	5	Tank	10,000g	33	6¼	Steel	48,300	June	September	Amer. Car & Fdy.
Cook Paint & Varnish Co.....	1	Tank	4,000g	25	2⅜	Steel	38,300	June	August	Amer. Car & Fdy.
	1	Tank	4,000g	..	..	....	.....	June	November	General American
Copper Range	10	S. S. Box	100,000	40	9	Steel	45,300	January	June	Pullman-Standard
Corn Products Refining Co. ...	1	Tank	8,000g	..	..	....	.....	March	April	General American
Cribari & Sons Co., B.	1	Tank	8,000g	..	..	....	.....	June	November	General American
Cumberland Gasoline Corp.	10	Tank	10,500g	..	..	....	.....	July	Feb. '42	General American
Delaware & Hudson	48*	Hopper	80,000	29	0	Steel	34,600	Dec. '40	July-Oct.	Company Shops
	5	Well	196,000	39	3	Steel	54,200	February	June-Aug.	Company Shops
	50	Hopper	80,000	29	0	Steel	34,600	March	....	Company Shops
	300	Hopper	100,000	31	0	Steel	41,600	May	Jan. '42	Amer. Car & Fdy.
	200	Gondola	100,000	41	9	Steel	44,300	May	December	Amer. Car & Fdy.
	50	Cov. Hopper	140,000	29	3	Steel	49,000	May	Feb. '42	Amer. Car & Fdy.
	15	Container	140,000	41	3	Steel	52,600	June	Jan. '42	Amer. Car & Fdy.
	20	Container	140,000	46	3	Steel	52,000	June	Jan. '42	Amer. Car & Fdy.
	2	Hopper	100,000	29	0	Steel	37,100	August	September	Company Shops
	102	Hopper	80,000	29	0	Steel	34,600	August	....	Company Shops
	10	Caboose	60,000	25	5	Steel	44,300	November	....	Company Shops
Delaware, Lackawanna & Western	250	Gondola	100,000	48	6	Steel	50,300	July	Feb. '42	Amer. Car & Fdy.
	600	D. S. Box	100,000	40	6	Steel	45,200	July	May '42	Amer. Car & Fdy.
	400	D. S. Box	100,000	40	6	Steel	45,580	July	Mar.-Apr.'42	Magor
Denver & Rio Grande Western..	502	Box	110,000	40	6	Steel	42,500	May	Jan. '42	Pressed Steel
	10	Caboose	.....	29	2½	Steel Frame	47,000	April	Aug.-Sept.	Company Shops
	10	Caboose	.....	29	2½	Steel Frame	47,000	October	Mar. '42	Company Shops
	100	Stock	80,000	36	6	Steel Frame	39,800	July	July '42	Company Shops
Detroit, Toledo & Ironton	100	Cov. Hopper	140,000	29	3	Steel	51,600	June	Jan. '42	Greenville
Diamond Alkali Co.	1	M. U. Tank	33,000	42	4⅜	Steel	51,800	November	November	Amer. Car & Fdy.
Donora Southern	36	Gondola	140,000	40	0	Steel Frame	46,000	February	Feb. '42	Company Shops
Dow Chemical Co.	1	Tank	8,000g	32	3	Steel	47,720	January	June	Amer. Car & Fdy.
	2	Tank	60,000	37	6⅛	Steel	88,700	March	August	Amer. Car & Fdy.
	2	Tank	8,000g	..	..	....	.....	January	Mar.-Apr.	General American
	12	Tank	8,000g	..	..	....	.....	March	May-June	General American
	2	Tank	60,000	..	..	....	.....	May	July	General American
	6	Tank	10,000g	..	..	....	.....	September	Jan. '42	General American
	2	Tank	60,000	..	..	....	.....	September	October	General American
	30	Tank	10,000g	..	..	....	.....	November	Apr. '42	General American
Drydock Associates	1	Flat	100,000	40	0	St. Underframe	37,862	March	July	Amer. Car & Fdy.
Du Pont de Nemours Co., E. I.	50	Tank	50,000	..	..	....	.....	January	May-Aug.	General American
	8	Tank	7,000g	..	..	....	.....	September	Dec.-Jan.	General American
	2	Tank	7,000g	..	..	....	.....	September	Mar.-Feb.	General American
	50	Tank	11,000g	35	3¾	Steel	69,900	January	April	Amer. Car & Fdy.
	2	Tank	8,200g	31	1½	Steel	45,400	February	May	Amer. Car & Fdy.
	100	Tank	11,000g	38	10¼	Steel	70,000	July	Jan. '42	Amer. Car & Fdy.
	150	Box	26,000	24	9	....	12,800	January	Mar.-June	General American

* 1940 totals have been adjusted to include these cars which were not reported last year.

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Eagle-Picher Mining & Smelting Co.	12	Hopper	140,000	..	..	Steel	.....	1941	....	Austin-Western
Elgin, Joliet & Eastern	250	Hopper	140,000	39	7	Steel	59,475	May	May-July	Ralston
	250	Hopper	140,000	39	7	Steel	60,000	June	Jan. '42	Amer. Car & Fdy.
	500	Gondola	100,000	48	6	Steel	.....	December	1942	Amer. Car & Fdy.
	500	D.E. Gondola	100,000	48	6	Steel	.....	December	....	General American
	200	Flat	100,000	50	0	St. Underframe	.....	December	....	Ralston
Erie	5	Flat	180,000	50	0	Steel	67,400	May	Feb. '42	Greenville
	50	Flat	140,000	53	6	Steel	61,700	April	Jan. '42	Greenville
	250	D. E. Gondola	140,000	52	6	Steel	61,800	April	Oct.-Nov.	Greenville
	50	Cov. Hopper	140,000	29	3	Steel	51,800	April	December	Amer. Car & Fdy.
	100	Furniture	100,000	50	6	Steel	59,100	April	December	Amer. Car & Fdy.
	100	Automobile	100,000	40	6	Steel	52,100	April	December	Amer. Car & Fdy.
	250	Hopper	100,000	33	0	Steel	42,500	April	December	General American
	800	Box	100,000	40	6	Steel	45,700	April	Oct.-Nov.	Pullman-Standard
	70	Caboose	.....	..	..	Steel	.....	April	August	Company Shops
Ethyl Gasoline Corp.	6	Tank	3,000g	27	0⅝	Steel	52,700	July	Feb. '42	Amer. Car & Fdy.
	12	Tank	6,000g	30	7⅛	Steel	65,500	July	Feb. '42	Amer. Car & Fdy.
	15	Tank	6,000g	..	..	Steel	.....	November	May '42	Amer. Car & Fdy.
Florida East Coast	30	Hopper	100,000	33	0	Steel	40,000	June	Jan. '42	Amer. Car & Fdy.
	30	Gondola	100,000	41	9	Steel	44,000	June	December	Amer. Car & Fdy.
Fraser-Brace Eng. Co.	8	Tank	7,850g	31	3	Steel	45,700	May	September	Amer. Car & Fdy.
	6	Tank	7,850g	31	3	Steel	45,700	August	December	Amer. Car & Fdy.
	4	Tank	7,850g	..	..	....	.....	October	Mar. '42	General American
Frontenac Pipe Line Co.	50	Tank	10,000g	31	3	Steel	47,600	July	Mar. '42	Amer. Car & Fdy.
Fruit Growers' Express	500	Refrigerator	77,000	40	0	Steel Frame	57,000	July	Jan.-June '42	Company Shops
Fuelane Corp.	3	Tank	10,500g	37	0	Steel	67,100	May	August	Amer. Car & Fdy.
General Chemical Co.	2	Tank	7,250g	..	..	....	.....	April	Jan. '42	General American
	17	Tank	76,500	..	..	....	.....	November	Apr. '42	General American
	8	Cov. Hopper	140,000	29	3	Steel	53,000	September	Feb. '42	General American
General Electric Co.	2	Tank	8,000g	31	5	Aluminum	48,900	April	Jan. '42	Amer. Car & Fdy.
	1	Cov. Hopper	140,000	29	3	Steel	53,200	January	April	Amer. Car & Fdy.
	2	Cov. Hopper	140,000	29	3	Steel	53,200	March	August	Amer. Car & Fdy.
	1	Cov. Hopper	140,000	29	3	Steel	53,200	May	September	Amer. Car & Fdy.
	2	Cov. Hopper	140,000	29	3	Steel	53,200	July	October	Amer. Car & Fdy.
Goodrich, B. F.	1	Tank	.....	..	..	....	.....	August	December	General American
Grand Trunk Western	200	Auto	88,000	50	6	Steel	54,700	February	October	Pressed Steel
	100	Box	88,000	50	6	Steel	51,700	February	November	Pressed Steel
	200	Gondola	140,000	52	8¼	St. Underframe	54,500	February	September	Magor
	100	Flat	140,000	56	0	Steel	58,700	February	August	Greenville
Great Northern	500	D. S. Box	110,000	40	6	Steel Frame	49,300	May	Apr. '42	Pressed Steel
	1,000	D. S. Box	100,000	40	6	Steel Frame	48,700	May	Jan.-Feb. '42	Pullman-Standard
	500	D. S. Box	100,000	40	6	Steel Frame	49,300	May	Jan.-Mar. '42	General American
	1,000	D. S. Box	100,000	40	6	Steel Frame	48,500	November	1942	Company Shops
	10	Caboose	80,000	..	..	St. Underframe	.....	May	October	Company Shops
	10	Caboose	80,000	..	..	St. Underframe	.....	July	December	Company Shops
Gulf Coast Lines	400	Gondola	110,000	45	0	Steel	45,100	August	May '42	Pressed Steel
	50	Flat	.....	50	0	Steel	.....	August	Mar. '42	Bethlehem
	200	Box	100,000	50	6	Steel	52,400	August	May '42	Amer. Car & Fdy.
	50	Box	100,000	50	6	Steel	55,300	September	Mar. '42	Amer. Car & Fdy.
Gulf, Mobile & Ohio	800	D. S. Box	80,000	40	6	Steel	44,100	June	Apr. '42	Amer. Car & Fdy.
	50	Auto	80,000	40	6	Steel	46,000	June	Apr. '42	Amer. Car & Fdy.
	150	Hopper	100,000	33	0	Steel	41,000	June	Jan. '42	Amer. Car & Fdy.
Halliburton Oil Well	25	Cov. Hopper	140,000	29	3	Steel	53,000	August	Jan. '42	General American
Hooker Electrochemical Co.	2	Tank	8,000g	34	0¾	Steel	45,100	January	June	Amer. Car & Fdy.
	2	Tank	4,000g	..	..	....	.....	January	June	General American
Howe Sound Co.	1‡	Flat	30,000	15	0	Steel Frame	7,150	February	April	Pacific Car & Fdy.
Huber, Inc., J. M.	12	Cov. Hopper	80,000	..	..	Steel Frame	.....	April	....	Amer. Car & Fdy.
Hunt Oil Co.	3	Tank	10,000g	32	4⅝	Steel	63,000	April	September	Amer. Car & Fdy.
Illinois Central	115	Cov. Hopper	140,000	29	3	Steel	53,500	January	May-June	General American
	500	D. S. Box	80,000	50	6	Steel	51,000	April	Oct.-Nov.	General American
	200	Refrigerator	80,000	40	0	Steel	59,800	April	Dec.-Jan. '42	General American
	100	Cov. Hopper	140,000	29	3	Steel	53,100	April	Nov.-Dec.	General American
	500	D. S. Box	80,000	50	6	Steel	51,000	April	October	Amer. Car & Fdy.
	100	Flat	100,000	50	6	St. Underframe	50,600	April	December	Amer. Car & Fdy.
	1,000	Hopper	100,000	33	0	Steel	44,800	April	Sept.-Nov.	Pullman-Standard
Indiana Harbor Belt	750	Box	110,000	40	6	Steel	45,800	June	June '42	Despatch Shops
	250	Box	110,000	50	6	Steel	54,400	June	Aug. '42	Despatch Shops
	300	H. S. Gondola	140,000	52	6	Steel	56,000	June	Aug. '42	Despatch Shops
	200	H. S. Gondola	140,000	65	6	Steel	63,000	June	Sept. '42	Despatch Shops
Inland Lime & Stone Co.	6	Dump	30 cu. yds.	30	10	Steel	67,000	January	July	Austin-Western
	6	Dump	30 cu. yds.	32	6¼	Steel	70,200	January	August	Pressed Steel
Inland Steel Co.	15	Stake	180,000	40	6	Steel Frame	90,000	October	Feb. '42	General American
International Great Northern	200	Gondola	110,000	45	0	Steel	45,100	August	May '42	Pressed Steel
	50	Flat	100,000	50	0	Steel	.....	August	Mar. '42	Bethlehem
	100	Box	100,000	40	6	Steel	46,000	August	May '42	Amer. Car & Fdy.
Kansas City Southern	5	Cov. Hopper	140,000	35	3	Steel	53,100	January	June	General American
	50	Auto-Box	100,000	50	6	Steel	58,200	April	November	Pullman-Standard
	200	D. S. Box	100,000	50	6	Steel	50,800	May	October	Pullman-Standard
Lake Superior & Ishpeming	100	Ore	100,000	19	7½	....	37,600	January	June	Bethlehem
	100	Ore	100,000	19	7½	Steel	37,600	March	June	Bethlehem
	50	Box	110,000	40	6	Steel	....	June	Aug. '42	Despatch Shops
Lehigh & New England	115	Cement Hop'r	140,000	26	3½	Steel	51,460	March	August	Amer. Car & Fdy.
	300	Hopper	110,000	33	0	Steel	42,100	May	Jan. '42	Pressed Steel
	100	Cement Hop'r	140,000	26	3½	Steel	53,100	May	Apr. '42	Amer. Car & Fdy.
Lehigh Valley	14	Caboose	.....	24	4⅜	Steel	44,000	March	August	Company Shops
	400	Box	121,000	40	6	Steel	45,800	May	Mar. '42	Pressed Steel
	100	Auto	110,000	50	6	Steel	59,000	May	Jan. '42	Amer. Car & Fdy.
	400	D. E. Gondola	140,000	52	6	Steel	54,100	June	Jan. '42	Bethlehem
	100	D. E. Gondola	140,000	65	6	Steel	57,600	June	November	Bethlehem
	1,000	Hopper	100,000	31	0	Steel	40,500	November	July '42	Bethlehem
Lennig & Co., Chas.	1	Tank	8,000g	..	..	....	.....	January	July	General American
Libbey-Owens Ford Glass Co.	1	Cov. Hopper	14,000	29	3	Steel	52,300	September	Deeember	Amer. Car & Fdy.
Linde Air Products Co.	20	Box	154,000	40	6	Steel	113,000	January	June	Pressed Steel
	30	Box	154,000	40	6	Steel	113,000	June	November	Pressed Steel
Litchfield & Madison	250	Hopper	100,000	33	0	Steel	44,500	May	Jan. '42	General American
Lone Star Gas Co.	1	Tank	10,500g	33	1½	Steel	65,500	February	June	Amer. Car & Fdy.
Louisiana & Arkansas	200	S. S. Box	100,000	50	6	Steel	50,800	April	Sept.-Oct.	Pullman-Standard
	75	Hopper	140,000	40	8	Steel	48,216	April	December	Pullman-Standard
Louisville & Nashville	100	S. S. Box	100,000	50	6	Steel	52,300	April	November	Pullman-Standard
	500	S. S. Box	100,000	40	6	Steel	44,700	April	Nov.-Dec.	Pullman-Standard
	500	Hopper	100,000	33	6	Steel	39,518	April	Dec.-Jan. '42	Pullman-Standard
	500	S. S. Box	100,000	40	6	Steel	44,100	April	November	Amer. Car & Fdy.
	500	Hopper	100,000	33	0	Steel	39,400	April	November	Amer. Car & Fdy.
Maine Central	10	Cement	140,000	26	3½	Steel	53,000	May	Feb. '42	Amer. Car & Fdy.
	100	Hopper	100,000	33	0	Steel	40,000	June	December	Bethlehem
	400	S. S. Box	80,000	40	6	Steel	43,900	May	Jan.-Feb. '42	Magor
Maryland Slag Co.	2	Air Dump	35 cu. yds.	..	..	Steel	.....	1941	....	Austin-Western
Mathieson Alkali Works	6	Box	100,000	40	1½	Steel	66,400	October	Mar. '42	Amer. Car & Fdy.
Michigan Limestone & Chem. Co.	1	Air Dump	50 cu. yds.	42	0	Steel	81,200	April	April	Pressed Steel
	30	Air Dump	50 cu. yds.	..	..	Steel	88,000	1941	....	Austin-Western

‡ Narrow gage.

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Midland Valley	5	Box	100,000	40	6	Steel	.....	June	....	Mount Vernon
Minneapolis & St. Louis	50	Box	100,000	40	6	Steel	44,600	March	October	Pullman-Standard
Minneapolis, St. Paul & Sault Ste. Marie	100	Flat	100,000	53	6	Steel	47,700	February	July-Aug.	Pullman-Standard
	200	D. S. Box	100,000	40	6	Steel	44,000	April	Oct.-Nov.	Pullman-Standard
	100	D. S. Auto	100,000	50	0	Steel	50,100	April	December	Pullman-Standard
	2	Hopper	140,000	29	3	Steel	52,800	July	September	Amer. Car & Fdy.
Missouri-Illinois	50	Gondola	110,000	45	6	Steel	45,100	August	May '42	Pressed Steel
	100	Box	100,000	40	6	Steel	46,000	September	Mar. '42	Amer. Car & Fdy.
	50	Cov. Hopper	100,000	29	3	Steel	53,000	August	Apr. '42	Amer. Car & Fdy.
Missouri-Kansas-Texas	30	Caboose	.....	30	7⅝	Steel Frame	43,600	May	September	Company Shops
Missouri Pacific	400	Hopper	110,000	33	0	Steel	41,500	January	September	Mount Vernon
	400	Hopper	110,000	33	0	Steel	41,300	January	September	Amer. Car & Fdy.
	400	Hopper	100,000	33	0	Steel	41,800	January	November	Bethlehem
	70	Cov. Hopper	140,000	33	0	Steel Frame	53,200	January	September	Mount Vernon
	2	Flat	250,000	58	10	Steel	126,500	January	December	Amer. Car & Fdy.
	100	Auto	100,000	50	6	Steel	64,000	May	December	Amer. Car & Fdy.
	200	Auto	100,000	50	6	Steel	64,000	May	Feb. '42	Mount Vernon
	800	Box	100,000	40	6	Steel	46,000	June	Apr. '42	Amer. Car & Fdy.
	50	Cov. Hopper	140,000	33	0	Steel	53,200	May	Feb. '42	Mount Vernon
	22	Cov. Hopper	140,000	31	5	Steel	59,000	May	Feb. '42	Company Shops
	500	Hopper	140,000	40	8	Steel	51,500	August	Jan.-Mar. '42	Pullman-Standard
	50	Gondola	140,000	65	0	Steel	67,600	September	Aug. '42	Mount Vernon
	750	Box	100,000	40	6	Steel	46,000	August	May '42	Amer. Car & Fdy.
	250	Box	100,000	40	6	Steel	46,000	September	Mar. '42	Amer. Car & Fdy.
	150	Rack	100,000	40	3	Steel	45,100	October	October	Company Shops
	2	Cab.-Cch.-Bag.	30,000	37	6½	Steel	48,000	January	September	Company Shops
	9	Cab.-Cch.-Bag.	30,000	37	6½	Steel	48,000	June	Feb. '42	Company Shops
	50	Flat	100,000	50	0	Steel	.....	August	Mar. '42	Bethlehem
Monongahela Connecting	5*	Gondola	240,000	38	2	Steel	52,300	Dec. '40	April	Company Shops
	45*	Gondola	240,000	38	2	Steel	57,400	Dec. '40	June	Company Shops
	35	Gondola	240,000	38	0	Steel	51,300	September	May '42	Company Shops
Monsanto Chemical Co.	4	Tank	7,000g	27	5	Steel	44,050	March	July	Amer. Car & Fdy.
	1	Tank	8,000g	31	6	Steel	52,500	March	July	Amer. Car & Fdy.
	2	Tank	12,000g	30	7	Steel	65,500	September	December	Amer. Car & Fdy.
	1	Tank	8,000g	31	6	Steel	42,000	October	Jan. '42	Amer. Car & Fdy.
	2	Tank	4,000g	..	..	....	.....	February	August	General American
	4	Tank	7,000g	..	..	....	.....	March	September	General American
	10	Tank	8,000g	..	..	....	.....	August	Dec.-Jan. '42	General American
	2	Tank	8,000g	..	..	....	.....	March	September	General American
Montour	300	Hopper	100,000	33	0	Steel	41,964	March	July	Pullman-Standard
Nashville, Chattanooga & St. Louis	200	Hopper	100,000	33	0	Steel	39,300	March	July	Pullman-Standard
	300	Gondola	100,000	42	0	Steel	41,900	June	October	Pullman-Standard
	500	D. S. Box	80,000	40	6	Steel	44,700	June	Jan.-Mar. '42	Pullman-Standard
National Tube Co.	98	Gondola	140,000	42	0	Steel	51,000	November	May '42	Magor
	12	Air Dump	30 cu. yds.	..	..	Steel	.....	1941	....	Austin-Western
Nevada Consolidated Copper Co.	5	Air Dump	30 cu. yds.	..	..	Steel	.....	1941	....	Austin-Western
New River & Pocahontas Consolidated Coal Co.	40	Hopper	100,000	31	3	Steel	41,300	January	Nov.-Dec.	Company Shops
New York Central	14	Flat	164,000	37	6	Steel	70,200	March	July	Despatch Shops
	1,000	H. S. Gondola	140,000	52	6	Steel	56,000	April	December	Despatch Shops
	500	Box	110,000	50	6	Steel	54,700	April	December	Despatch Shops
	500	Auto Box	100,000	50	6	Steel	.....	April	October	Despatch Shops
	10	Well	195,000	39	3	Steel	55,500	May	October	Despatch Shops
	3,000	Box	110,000	40	6	Steel	45,500	June	Feb. '42	Despatch Shops
New York, Chicago & St. Louis	500	S. S. Box	100,000	40	6	Steel	45,400	March	September	Amer. Car & Fdy.
	8	Cov. Hopper	140,000	29	3	Steel	53,300	April	August	Amer. Car & Fdy.
	10	Cov. Hopper	140,000	26	3⅝	Steel	53,720	April	August	Amer. Car & Fdy.
	250	Hopper	100,000	33	0	Steel	40,400	June	Mar. '42	Amer. Car & Fdy.
	900	S. S. Box	100,000	40	6	Steel	45,000	June	Jan.-Mar. '42	General American
	250	Gondola	100,000	48	6	Steel	50,700	July	Feb. '42	Greenville
	100	Auto	100,000	50	6	Steel	57,725	July	Jan. '42	Ralston
	25	Cov. Hopper	140,000	29	3	Steel	51,800	July	Jan. '42	Amer. Car & Fdy.
	25	Cov. Hopper	140,000	29	3	Steel	52,000	November	Jan. '42	Amer. Car & Fdy.
New York, New Haven & Hartford	1,000	S. S. Box	121,000	40	6	Steel	44,900	February	August	Pressed Steel
	50	Caboose	.....	27	0	Steel	43,800	June	Jan.-Mar. '42	Pullman-Standard
	10	Transformer	198,000	37	6	Steel Frame	72,000	August		Company Shops
	3	Transformer	275,000	57	9	Steel Frame	130,700	December		Company Shops
Niacet Chemical Corp.	1	Tank	8,000g	34	4 1/16	Aluminum Alloy	35,700	March	July	Amer. Car & Fdy.
Niagara Alkali Co.	10	Tank	60,000	30	7	Steel	65,500	August	Jan. '42	Amer. Car & Fdy.
Norfolk & Western	1,000	D. S. Box	100,000	40	6	Steel	49,600	April	Nov.-Jan. '42	Ralston
	1,000	Hopper	140,000	36	9¾	Steel	51,600	June	Feb.-Apr. '42	Virginia Bridge
	200	D. S. Box	100,000	50	6	Steel	55,700	April	Nov.-Dec.	Greenville
	500	Hopper	140,000	36	9¾	Steel	51,400	June	December	Bethlehem
	25	L. S. Gondola	140,000	65	6	Steel	64,800	May	November	Virginia Bridge
	25	Cov. Hopper	140,000	31	0	Steel	52,000	June	Jan.-Feb. '42	Company Shops
	25	Cov. Hopper	140,000	31	0	Steel	52,000	September	1942	Company Shops
	20	Air Dump	30 cu. yds.	..	..	Steel	66,200	1941	....	Austin-Western
Norfolk Southern	3	Box	80,000	40	6	Steel	44,500	January	December	Magor
Northern Pacific	100	D. S. Box	100,000	40	9	Steel Frame	45,500	January	August	Company Shops
	1,350	D. S. Box	100,000	40	6	Steel	46,000	June	Feb. '42	Amer. Car & Fdy.
	150	D. S. Box	100,000	40	9	Steel Frame	46,600	June	Jan. '42	Company Shops
	500	D. S. Box	100,000	40	9	Steel	45,400	May	Jan.-Mar. '42	Pullman-Standard
	200	Ballast	140,000	40	8	Steel	54,300	June	Jan. '42	Amer. Car & Fdy.
Old Hickory Chemical Co.	1	Tank	10,000g	..	..	....	.....	August	December	General American
Oldbury Electrochemical Co.	2	Tank	3,600g	..	..	....	.....	January	July-Aug.	General American
Oliver Iron Mining Co.	30	Air Dump	30 cu. yds.	33	0	Steel	65,800	January	December	Pressed Steel
Pacific Fruit Express Co.	1,000	Refrigerator	80,000	40	3	Steel Frame	55,700	January	December	Pac. Car & Fdy.
Pennsylvania	1,000	D. S. Box	100,000	40	6	Steel	50,300	January	Feb. '42	Company Shops
	700	D. S. Box	100,000	50	6	Steel	55,000	January	November	Company Shops
	300	D. S. Box	100,000	50	6	Steel	56,200	January	November	Company Shops
	500	Gondola	140,000	65	6	Steel	63,400	January	Jan. '42	Company Shops
	2,000	Gondola	140,000	46	0	Steel	51,500	January	November	Company Shops
	200	Caboose	.....	23	3¾	Steel	43,150	January	May '42	Company Shops
	2,000	D. S. Box	100,000	50	6	Steel	55,000	June	July '42	Company Shops
	2,700	Hopper	100,000	31	0	Steel	40,600	June	Nov. '42	Company Shops
	500	Gondola	140,000	52	6	Steel	56,500	June	Nov. '42	Company Shops
	500	Gondola	140,000	46	0	Steel	51,500	June	Dec. '42	Company Shops
	300	Cov. Hopper	140,000	31	0	Steel	50,000	June	Sept. '42	Company Shops
	10	Flat	250,000	48	3	Steel	96,500	June	Feb. '42	Company Shops
	10	Well	250,000	51	3	Steel	97,700	June	Apr. '42	Company Shops
	50	Caboose	.....	23	3¾	Steel	43,150	June	Sept. '42	Company Shops
Pennsylvania Salt Mfg. Co.	15	Tank	60,000	30	7	Steel	66,820	February	July	Amer. Car & Fdy.
	10	Tank	60,000	30	7	Steel	65,500	June	December	Amer. Car & Fdy.
	10	Tank	60,000	30	7	Steel	65,100	July	October	Amer. Car & Fdy.
	4	Tank	50,000	..	..	....	.....	January	May	General American
Pere Marquette	40	Caboose	60,000	24	1½	Steel	44,880	June	November	St. Louis Car
	100	S. S. Box	100,000	40	6	Steel	43,500	February	July	Amer. Car & Fdy.
	100	S. S. Box	100,000	40	6	Steel	44,600	March	Sept.-Oct.	Pullman-Standard
	100	S. S. Box	100,000	40	6	Steel	43,800	March	June-July	General American

* 1940 totals have been adjusted to include these cars which were not reported last year.

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Pere Marquette (cont'd)	100	Auto.-Furn.	80,000	40	6	Steel	51,250	March	August	Ralston
	100	Automobile	100,000	50	6	Steel	60,800	March	September	Greenville
	25	Cov. Hopper	140,000	29	3	Steel	51,800	April	December	Amer. Car & Fdy.
Phila. Quartz Co. of Cal.	2	Tank	8,000g	31	6	Steel	43,540	March	June	Amer. Car & Fdy.
Phillips Petroleum Co.	1	Tank	10,500g	..	..	Steel	.....	February	July	Amer. Car & Fdy.
	27*	Tank	10,500g	..	..	....	.....	Dec. '40	Mar.-July	General American
	25	Tank	10,500g	..	..	....	.....	February	Sept.-Jan. '42	General American
	25	Tank	10,500g	..	..	....	.....	May	Jan.-Feb. '42	General American
	30	Tank	10,500g	..	..	....	.....	July	Jan.-Feb. '42	General American
Phosphate Mining Co.	2	Tank	8,000g	31	6	Steel	42,000	October	December	Amer. Car & Fdy.
	1	Tank	7,000g	27	6	Steel	42,900	October	December	Amer. Car & Fdy.
Pittsburgh & Lake Erie	900*	Box	110,000	40	6	Steel	45,900	Dec. '40	June	Pressed Steel Car
	100*	Box	110,000	50	6	Steel	53,700	Dec. '40	July	Pressed Steel Car
Pittsburgh Plate Glass	20	Tank	60,000	30	7	Steel	65,500	July	Feb. '42	Amer. Car & Fdy.
	2	Tank	60,000	..	..	....	.....	April	September	General American
Pittsburgh Steel Co.	4	Hot Slag	140,000	36	0	Steel	100,600	August	Mar. '42	Pressed Steel
Protane Corp.	3	Tank	10,500g	..	..	....	.....	January	Apr.-June	General American
Read & Co., Inc., Chas. L.	1	Tank	8,000g	31	6	Steel	41,800	May	June	Amer. Car & Fdy.
Reading	100	Gondola	140,000	52	6	Steel	55,500	April	Feb. '42	Company Shops
	400	Gondola	140,000	52	6	Steel	57,400	April	Feb. '42	Company Shops
	50	Caboose	.....	24	4⅜	Steel	42,400	July	Mar. '42	Company Shops
	1,000	Coal	110,000	31	0	Steel	42,900	August	Sept. '42	Company Shops
	500	Gondola	140,000	52	6	Steel	55,500	June	November	Bethlehem
Republic Steel Corp.	2*	Air Dump	30 cu. yds.	32	6	Steel	68,500	Dec. '40	October	Pressed Steel
	2*	Cinder Pot	350,000	31	6	Steel	78,000	Dec. '40	October	Pressed Steel
	2	Air Dump	40 cu. yds.	36	9	Steel	78,200	July	July	Pressed Steel
	3	Air Dump	50 cu. yds.	42	0	Steel	83,400	November	Apr. '42	Pressed Steel
Republic Tank Car Co.	4	Tank	10,500g	37	0	Steel	69,700	March	August	Amer. Car & Fdy.
	1	Tank	10,500g	37	0	Steel	69,700	September	Feb. '42	Amer. Car & Fdy.
Robeson Process Co.	5	Tank	8,000g	31	10½	Steel	43,400	January	June	Amer. Car & Fdy.
	10	Tank	8,000g	31	6	Steel	43,500	June	September	Amer. Car & Fdy.
Roebling's Sons Co., John A.	10	Gondola	140,000	46	3	Steel	57,100	January	August	Amer. Car & Fdy.
Rohm & Haas Co.	1	Tank	8,000g	31	6	Steel	51,500	June	September	Amer. Car & Fdy.
	1	Tank	10,000g	..	..	....	.....	February	April	General American
St. Louis-San Francisco	16	Box	100,000	40	6	Steel	45,500	1941	Feb. '42	Company Shops
	1	Box	100,000	40	6	Steel	46,900	1941	February	Company Shops
	18	Caboose	80,000	29	0	Steel Frame	44,900	1941	Apr.-Sept.	Company Shops
St. Louis Southwestern	150	D. S. Box	100,000	40	6	Steel	43,500	July	Jan.-Mar. '42	Company Shops
	100	D. S. Box	100,000	50	6	Steel	49,500	July	Apr.-May '42	Company Shops
	100	D. S. Auto	100,000	40	6	Steel	45,000	July	May-July, '42	Company Shops
	100	Coal	100,000	..	..	St. Underframe	49,400	July	July-Sept. '42	Company Shops
	50	Rack	140,000	51	0	Steel	58,000	July	Sept.-Oct. '42	Company Shops
	6	Caboose	60,000	29	5	St. Underframe	44,300	July	Jan.-Mar. '42	Company Shops
Sanderson & Porter	50	Box	100,000	40	6	Steel	44,800	March	June	General American
	50	Box	100,000	40	6	Steel	45,000	July	Jan. '42	General American
	25	Box	100,000	40	6	Steel	44,500	November	Mar. '42	General American
Seaboard Air Line	500	D. S. Box	100,000	40	6	Steel	49,000	June	Jan.-Mar. '42	Pullman-Standard
	100	Hopper	140,000	40	8	Steel	48,700	July	Mar. '42	Bethlehem
	100	Flat	100,000	50	0	St. Underframe	43,100	June	Feb. '42	Greenville
	50	Cement	140,000	29	3	Steel	53,300	June	Feb. '42	Greenville
Semet-Solvay Co.	1	Tank	10,000g	31	6	Steel	47,600	April	August	Amer. Car & Fdy.
	15	Tank	10,000g	31	6	Steel	47,600	July	October	Amer. Car & Fdy.
	15	Tank	10,000g	..	..	....	.....	April	June-July	General American
Shell Chemical Co.	3	Tank	11,200g	34	9⅛	Steel	66,540	February	May	Amer. Car & Fdy.
	4	Tank	6,000g	27	6	Steel	40,000	June	October	Amer. Car & Fdy.
	4	Tank	8,000g	31	6	Steel	41,320	June	September	Amer. Car & Fdy.
	2	Tank	10,000g	31	6	Steel	47,600	June	September	Amer. Car & Fdy.
	2	Tank	7,500g	31	0	Steel	47,800	June	October	Amer. Car & Fdy.
	2	Tank	11,200g	38	10¼	Steel	68,200	September	Mar. '42	Amer. Car & Fdy.
	2	Tank	11,200g	..	..	....	.....	February	May	General American
	2	Tank	11,200g	..	..	....	.....	June	August	General American
	8	Tank	8,000g	..	..	....	.....	June	September	General American
	2	Tank	11,200g	..	..	....	.....	September	Feb. '42	General American
Shippers Car Line	19	Cov. Hopper	140,000	29	3	Steel	53,200	October	November	Amer. Car & Fdy.
	60	Cov. Hopper	140,000	29	3	Steel	52,800	August	Jan. '42	Amer. Car & Fdy.
	1	Flat	140,000	46	10	Steel	40,000	May	December	Amer. Car & Fdy.
	9	Flat	140,000	46	10	Steel	40,000	August	December	Amer. Car & Fdy.
	6	Cov. Hopper	140,000	34	3	Steel	52,300	March	April	Amer. Car & Fdy.
	7	Flat	140,000	46	10	Steel	47,245	January	June	Amer. Car & Fdy.
	1	Cov. Hopper	140,000	29	3	Steel	48,140	October	October	Amer. Car & Fdy.
	1	M. U. Tank	33,000	42	4	Steel	53,400	April	April	Amer. Car & Fdy.
	8	Tank	8,000g	32	1	Aluminum	48,300	April	April	Amer. Car & Fdy.
	27	Tank	4,000g	..	..	Steel	.....	April	April	Amer. Car & Fdy.
	18	Tank	6,000g	..	..	Steel	.....	April	April	Amer. Car & Fdy.
	38	Tank	7,000g	..	..	Steel	.....	April	April	Amer. Car & Fdy.
	31	Tank	8,000g	..	..	Steel	.....	April	April	Amer. Car & Fdy.
	100	Tank	10,000g	..	..	Steel	.....	April	April	Amer. Car & Fdy.
	10	Tank	10,500g	..	..	Steel	.....	April	April	Amer. Car & Fdy.
	15	Tank	4,000g	..	..	Steel	.....	October	October	Amer. Car & Fdy.
	36	Tank	6,000g	..	..	Steel	.....	October	October	Amer. Car & Fdy.
	32	Tank	7,000g	..	..	Steel	.....	October	October	Amer. Car & Fdy.
	66	Tank	8,000g	..	..	Steel	.....	October	October	Amer. Car & Fdy.
	28	Tank	10,00g	..	..	Steel	.....	October	October	Amer. Car & Fdy.
Smith-Weihman Co., Inc.	2	Tank	8,000g	31	6	Steel	41,200	June	September	Amer. Car & Fdy.
Snyder Sons, Thos. E.	5	Tank	8,000g	..	..	....	.....	February	April	General American
	6	Tank	8,000g	..	..	....	.....	March	September	General American
	5	Tank	6.000g	..	..	....	.....	March	September	General American
	16	Tank	8,000g	..	..	....	.....	June	September	General American
Solvay Process Company	1	Tank	60,000g	..	..	....	.....	March	May	General American
	2	Tank	60,000g	..	..	....	.....	May	July	General American
Southern	1,511	Box	100,000	40	6	Steel	47,450	May	Jan.-June '42	Pullman-Standard
	1,500	Box	100,000	40	6	Steel Frame	.....	May	Jan.-Mar. '42	Mount Vernon
	400	Auto	100,000	50	6	Steel	.....	May	Jan.-Mar. '42	Mount Vernon
	500	Flat	140,000	53	6	St. Underframe	.....	May	Jan.-Mar. '42	Mount Vernon
	100	M.T. Gondola	140,000	65	0	Steel	.....	May	Jan.-Mar. '42	Mount Vernon
	26	Caboose	.....	32	4	Steel	47,500	May	July-Nov.	Company Shops
Southern Pacific	500	Box	100,000	40	6¼	Steel	.....	March	Jan. '42	Bethlehem
	700	Gondola	100,000	41	6	Steel	.....	July	Apr. '42	Bethlehem
	500	Box	100,000	50	6	Steel Frame	54,200	March	.....	Mount Vernon
	4	Flat	400,000	44	0	....	.....	May	.....	Mount Vernon
	500	Box	100,000	50	6	Steel	.....	June	.....	Mount Vernon
	250	Box	100,000	40	6	Steel	45,600	March	July-Aug.	Pullman-Standard
	700	Box	100,000	40	6	Steel	46,000	June	Apr.-June '42	Pullman-Standard
	200	Tank	12,500g	..	..	....	.....	July	Feb.-Mar. '42	General American
	50	Tank	8,000g	..	..	....	.....	July	Feb.-Mar. '42	General American
	500	Box	110,000	40	6	Steel	45,700	March	October	Pressed Steel
	700	Box	110,000	40	6	Steel	45,700	June	Apr. '42	Pressed Steel
	700	Box	100,000	40	6	Steel	45,500	July	Feb. '42	Amer. Car & Fdy.
	150	Ballast	140,000	31	1	Steel	48,100	July	Mar. '42	Amer. Car & Fdy.
	300	Flat	140,000	53	6	Steel Frame	.....	July	.....	Pac. Car & Fdy.
	10	Flat	140,000	..	..	Steel	.....	August	Aug.-Oct.	Company Shops
	130	Flat	140,000	..	..	Steel	.....	August	1942	Company Shops

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Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Southern Pacific (cont'd)	90	Gondola	140,000	..	..	Steel	.....	August	1942	Company Shops
	150	Caboose	80,000	29	3	Steel	46,500	August	1942	Company Shops
Stauffer Chemical Co.	1	Tank	8,000g	..	..	....	.....	January	April	General American
	2	Tank	10,000g	..	..	....	.....	March	October	General American
Stone & Webster Eng. Co.	10	Tank	7,000	..	..	....	.....	February	July-June	General American
	1	Tank	10,000g	..	..	....	.....	February	April	General American
	2	Tank	7,000g	..	..	....	.....	February	September	General American
Tennessee Coal, Iron & R. R. Co.	6	Hot Mould	140,000	40	0	Steel	64,500	January	June	Pullman-Standard
	20	Gondola	140,000	36	6½	Steel	55,700	January	June	Pullman-Standard
	20	Flat	140,000	23	8	Steel	38,000	January	August	Pullman-Standard
	90	Ore	140,000	26	2½	Steel	44,300	February	Dec.-Jan. '42	Pullman-Standard
	85	Coal	140,000	38	10	Steel	58,700	February	Jan.-Mar. '42	Pullman-Standard
	5	Air Dump	50 cu. yds.	42	0	Steel	82,300	February	December	Pressed Steel Car
	56	Coal	140,000	38	9	Steel	.....	August	.....	Company Shops
	10	Ore	140,000	21	0	Steel	.....	November	.....	Company Shops
Texas & New Orleans	500	D. S. Box	100,000	40	6	Steel	45,200	March	July-Aug.	General American
	250	D. S. Box	100,000	40	6	Steel	45,600	March	July-Aug.	Pullman-Standard
	50	Gondola	140,000	40	1	Steel	57,000	April	September	Amer. Car & Fdy.
	50	Gondola	140,000	65	0	Steel	67,000	March	Feb.-Apr. '42	Company Shops
	15	Caboose	80,000	29	3	Steel	46,500	March	Mar. '42	Company Shops
	15	Caboose	80,000	29	3	Steel	46,500	August	Mar. '42	Company Shops
Timken Roller Bearing Co.	1	Air Dump	30 cu. yds	..	..	Steel	.....	1941	.....	Austin-Western
Tin Processing Co.-Metal Reserve Co.	9	Tank	12,000g	34	8	Steel	51,300	September	Jan. '42	Amer. Car & Fdy.
Turpentine & Rosin Factors	1	Tank	8,000g	..	..	....	.....	February	April	General American
	2	Tank	4,000g	..	..	....	.....	February	June	General American
Union Carbide Co.	1	Hopper	100,000	30	0	Steel	39,420	March	July	Amer. Car & Fdy.
Union Oil Co.	2	Tank	12,000g	42	3½	Steel	82,000	August	Jan. '42	General American
Union Pacific	300	Flat	100,000	53	6	Steel	47,500	January	June-July	Pullman-Standard
	50	Gondola	140,000	65	6	Steel	61,700	January	May	Pullman-Standard
	250	D. S. Auto	100,000	50	6¼	Steel	53,900	January	1942	Company Shops
	100	Caboose	60,000	30	0	Steel Frame	52,000	April	1942	Mount Vernon
	1,000	D. S. Box	100,000	40	6¼	Steel	44,300	May	1942	Company Shops
	1,000	D. S. Box	100,000	40	6¼	Steel	43,000	May	1942	Company Shops
United Carbon Co.	10	Cov. Hopper	80,000	45	10⅞	Steel	51,900	April	December	General American
United States Navy Dept.	20	Flat	100,000	40	0	Steel Underframe	38,200	May	Jan. '42	Magor
	5‡	D. S. Box	60,000	33	0	Steel Frame	31,220	January	May	Pac. Car & Fdy.
	6‡	Flat	40,000	20	0	Steel Frame	15,300	November	.....	Pac. Car & Fdy.
	4‡	Flat	40,000	20	0	Steel Frame	13,500	November	.....	Pac. Car & Fdy.
	15	Flat	100,000	40	0	St. Underframe	37,862	March	July	Amer. Car & Fdy.
	50	Tank	6,000g	27	6	Steel	.....	May	August	Amer. Car & Fdy.
	50	Flat	60,000	32	4	Steel	25,415	May	August	Amer. Car & Fdy.
	2	Box	100,000	40	7½	Steel	45,000	May	December	Amer. Car & Fdy.
	3	Tank	12,600g	35	3	Steel	.....	May	December	Amer. Car & Fdy.
	10	M. U. Tank	33,000	42	4	Steel	.....	June	November	Amer. Car & Fdy.
	95	Tank	11,000g	..	..	Steel	.....	November	Apr. '42	Amer. Car & Fdy.
	1	Tank	10,000g	..	..	....	.....	May	July	General American
	3	Tank	50,000	..	..	....	.....	November	Mar. '42	General American
	1	Flat	200,000	55	11	Steel	69,300	March	August	Greenville
	2	D. S. Box	100,000	40	6	Steel	44,400	April	December	Greenville
	3	D. S. Box	100,000	39	10	Steel	52,400	August	Feb. '42	Greenville
	3	Box	100,000	40	6	Steel	44,900	May	August	General American
	6	Box	80,000	40	6	Steel	44,200	June	Jan. '42	General American
	1	Box	80,000	40	6	Steel	44,200	September	Jan. '42	General American
	10	Box	100,000	40	6	Steel	44,200	October	Mar. '42	General American
United States Sugar Corp.	75	Cane	60,000	39	4	Steel	33,300	March	Nov.-Dec.	Magor
	1	Caboose	.....	..	..	Steel	.....	....	October	Company Shops
United States War Dept.	68	Ammunition	68,000	46	0	Steel	.....	September	Jan.-May '42	St. Louis Car
	2	Tank	7,200g	..	..	....	.....	May	September	General American
	50	Tank	10,000g	..	..	Steel	46,000	June	October	General American
	4	Tank	10,000g	..	..	....	.....	June	September	General American
	500	Tank	10,000g	..	..	Steel	.....	June	Oct.-Jan. '42	General American
	60	Tank	10,000g	..	..	Steel	48,300	November	Apr. '42	General American
	20	S. S. Box	80,000	40	6	Steel	44,900	January	June	Greenville
	29	Fire Control	80,000	40	6	Steel	54,300	June	Jan. '42	Greenville
	4	Air Dump	12 cu. yds.	24	1	Steel	33,000	July	October	Austin-Western
	62	Box	.....	..	..	Wood	.....	1941	.....	Austin-Western
	4	Box	80,000	40	6	Steel	44,200	May	August	General American
	12	Box	80,000	40	6	Steel	44,200	June	Jan. '42	General American
	10	Box	80,000	40	6	Steel	44,200	June	Jan. '42	General American
	10	Flat	100,000	..	..	Steel Frame	44,000	July	December	Haffner-Thrall
	12	Flat	80,000	40	6	Steel Frame	39,600	June	Jan. '42	Haffner-Thrall
	10	Flat	100,000	50	0	Steel Frame	44,000	July	July	Haffner-Thrall
	6	Flat	40,000	26	0	Steel Frame	22,000	November	May '42	Pressed Steel
	95	Tank	11,000	42	3½	Steel Frame	55,000	November	Mar.-Apr. '42	Amer. Car & Fdy.
	1*	Caboose	40,000	25	10½	Steel Frame	.....	Dec. '40	April	Haffner-Thrall
Utah Copper Co.	75	Ore	220,000	24	5	Steel	48,000	February	November	Pressed Steel
	2	Caboose	60,000	19	0	Steel Frame	37,700	October	Jan. '42	Pac. Car & Fdy.
Utilities Distrib., Inc.	2	Tank	10,500g	37	0	Steel	67,100	June	September	Amer. Car & Fdy.
Virginia Smelting Co.	2	Tank	60,000	30	7	Steel	65,100	June	August	Amer. Car & Fdy.
	2	Tank	60,000	30	7	Steel	65,100	August	December	Amer. Car & Fdy.
Virginian	100	S. S. Box	121,000	40	6	Steel	44,500	January	July	Pressed Steel
	900	Hopper	110,000	33	0	Steel	42,400	November	Apr. '42	Company Shops
	100	Gondola	110,000	46	0	Steel	43,400	November	June '42	Company Shops
Wabash	15	Caboose	.....	28	5	Steel	.....	February	October	Company Shops
	50	Gondola	140,000	65	6	Steel	.....	March	December	Company Shops
	150	Auto	100,000	50	6	Steel	.....	April	December	Company Shops
	15	Cov. Hopper	140,000	29	3	Steel	53,000	May	December	General American
	10	Cov. Hopper	140,000	29	3	Steel	51,500	May	September	Amer. Car & Fdy.
	1,050	Box	100,000	40	6	Steel	.....	June	July '42	Company Shops
	100	Gondola	140,000	52	6	Steel	.....	July	Aug. '42	Company Shops
	25	Cov. Hopper	140,000	29	3	Steel	53,000	May	December	General American
Warren Petroleum Corp.	15	Tank	10,500g	..	..	Steel	.....	June	Jan.-Feb. '42	General American
	25	Tank	10,500g	37	0	Steel	68,500	June	October	Amer. Car & Fdy.
	20	Tank	10,500g	37	0	Steel	68,500	September	Feb. '42	Amer. Car & Fdy.
Weirton Steel Co.	18	Flat	110,000	36	0	Steel Frame	39,000	September	1942	Company Shops
Western of Alabama	60	Box	100,000	40	6	Steel	44,700	April	Nov.-Dec.	Pullman-Standard
Western Fruit Express	385	Refrigerator	77,000	40	0	Steel Frame	57,000	August	Jan.-June '42	Company Shops
	15	Refrigerator	118,000	50	0	Steel Frame	80,000	August	Jan.-June '42	Company Shops
Western Maryland	200	Box	110,000	40	6	Steel	47,300	June	Feb. '42	Pressed Steel
	300	Hopper	100,000	31	0	Steel	41,300	June	Jan. '42	Bethlehem
	40	Cov. Hopper	140,000	26	3½	Steel	52,000	March	September	Amer. Car & Fdy.
	200	Gondola	100,000	52	6	Steel	49,800	June	Jan. '42	Greenville
	25	Flat	100,000	50	0	Steel	45,800	June	Jan. '42	Greenville
	4	Flat	275,000	..	..	Steel	108,300	April	Oct.-Nov.	Company Shops
Western Pacific	350	Box	100,000	40	6	Steel	40,000	May	Feb. '42	Mount Vernon
	300	Flat	100,000	50	0	St. Underframe	40,000	May	Feb. '42	Mount Vernon
Westinghouse Elec. & Mfg. Co.	4	Flat	140,000	53	6	Steel	61,700	May	December	Greenville
Wheeling & Lake Erie	500	Hopper	120,000	33	0	Steel	40,900	April	November	Amer. Car & Fdy.
Wheeling Steel Corp.	5	Air Dump	50 cu. yds.	42	2½	Steel	86,200	April	Jan. '42	Pressed Steel
Whitin Machine Works	6	Flat	20,000	16	0	Steel	5,400	January	August	Magor
Wisconsin Central	50	Ballast	100,000	33	4½	Steel	45,900	February	July	Amer. Car & Fdy.
	300	D. S. Auto	100,000	50	6	Steel	50,100	June	Jan.-Mar. '42	Pullman-Standard

* 1940 totals have been adjusted to include these cars which were not reported last year.
‡ Narrow gage.

United States — Export

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Argentine State Railways	325	S. S. Box	50,000	30	2⅛	Steel	25,652	September	1942	Pullman-Standard
	50	S. S. Box	50,000	30	2⅛	Steel	26,550	September	1942	Pullman-Standard
	175	Box	55,100	..	..	....	.....	September	.....	Amer. Car & Fdy.
Arundel Corp. & Cons. Eng. Co. (For Naval Air Sta., San Juan P. R.)	100	Flat	100,000	..	..	St. Underframe	.....	June	November	Amer. Car & Fdy.
Aspillaga Anderson Hermanos	30	Cane	16,000	15	1	Steel	4,880	July	Feb. '42	Pressed Steel
Balfour Guthrie Co., Ltd., (For Ecuador)	1	Tank	6,500g	..	..	....	.....	November	.....	Amer. Car & Fdy.
Canadian Pacific	250	Hopper	100,000	33	0	Steel	42,600	April	Oct.-Nov.	Magor
Cebu Portland Cement Co., P. I.	2	Gondola	60,000	31	0	Steel	17,050	February	October	Pressed Steel
Cia. de Cementos Portland Diamante (Colombia)	12	Dump	65 cu. ft.	..	..	....	.....	April	October	Amer. Car & Fdy.
Cia. Civil E Industrial de Attencingo-Mexico	50	Cane	17,600	25	1	Steel	7,900	March	Feb. '42	Pressed Steel
Cia. de Mines de Huaron	10	Flat	24,000	16	0	Steel	6,380	August	Mar. '42	Pressed Steel
Cia. Industrial Azucarera, S. A.	30	Cane	33.000	28	0	Steel	15,600	June	Mar. '42	Pressed Steel
Cia. Siderurgica Belgo-Miniera (Brazil, S. A.)	24	Gondola	66,000	..	..	Steel	.....	March	November	Amer. Car & Fdy.
"CoBrazil" Compania de Mineracoa E Metallurgia "Brazil"	17	Flat	40,000	26	3	Steel	14,980	May	Jan. '42	Pressed Steel
Gregg Company, Ltd., Ecuador, S. A.	25	Gondola	60,000	35	9	Steel	24,180	April	Feb. '42	Pressed Steel
Leonard, Inc., Robert (For Bolivian Govt. Oil Fields)	18	Tank	60,000	..	..	....	.....	November	.....	Amer. Car & Fdy.
National Railways of Mexico	1,000	Box	80,000	40	6	Steel	38,000	June	Jan.-Mar. '42	Magor
Negociacion Tuman	30	Cane	8,000	16	0	Steel	3,775	October	June '42	Pressed Steel
Royal State Rys. of Thailand	150	Gondola	27,550	22	5¾	Steel	16,150	January	September	Magor
	100	Gondola	27,550	22	5¾	Steel	16,350	January	October	Magor
	100	Flat	27,500	21	6	Steel	10,750	January	September	Magor
Sadonia, Ltd., Belgian Congo	52	Flat	30.863	32	9¾	Steel	11,300	October	Apr. '42	Pressed Steel
P. Santos Gil & Cia. Ltda. (Port. E. Afr. Ry. Lourenco Marques)	60	Gondola	44,000	..	..	....	.....	January	August	Amer. Car & Fdy.
Surinaamsche Bauxite Maatschappij, Dutch Guiana, S. A.	10	Dump	14½ cu. yd.	20	0	Steel	30,650	July	Mar. '42	Pressed Steel
Texas Co. (Costa Rica)	4	Tank	6,000g	..	..	....	.....	April	September	Amer. Car & Fdy.
(Brazil)	10	Tank	5,600g	..	..	....	.....	May	.....	Amer. Car & Fdy.
Tropical Oil Co. (For Colombia)	2	Tank	6,000g	..	..	....	.....	May	November	Amer. Car & Fdy.
Transit & Storage Co. (For Newfoundland Govt.)	6	Tank	6,000g	..	..	....	.....	February	June	Amer. Car & Fdy.
U. S. S. R.	160	Air Dump	80,000	27	6	Steel	51,300	March	Apr. '42	Magor
	30	Air Dump	80,000	29	6	Steel	51,000	January	Apr. '42	Magor
United Fruit	100	Banana	30,000	40	0	Steel	22,864	May	December	Pullman-Standard
United States Treasury Dept.	2,400	Flat	11,023	16	5	Steel	3,130	November	May '42	Pressed Steel
United States War Dept. (for China)	75	Flat	44,000	21	10	Steel	17,600	November	Apr. '42	Magor
(for China)	75	Gondola	44,000	21	2	Steel	19,900	November	Apr. '42	Magor
(for China)	40	Gondola	66,000	34	5⅜	Steel	31,150	November	Apr. '42	Magor
(for China)	40	Flat	66,000	38	7⅜	Steel	27,400	November	Apr. '42	Magor
	6	Flat	40,000	26	0	Steel	18,100	November	Apr. '42	Pressed Steel
(for Newfoundland)	50	Tank	5,000g	..	..	....	.....	May	August	Amer. Car & Fdy.
	50	Flat	60,000	..	..	....	.....	May	August	Amer. Car & Fdy.
United Sugar Companies, S. A.	12	Cane	88,200	46	0	Steel	49,000	May	Feb. '42	Pressed Steel
Viuda De Piedra E Hijos, Sociedad Agricola Pomalca, Ltda.	40	Cane	16,000	17	8	Steel	5,100	July	Feb. '42	Pressed Steel

Canada

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Alberta Nitrogen Co.	20	Tank	11,400g	40	0½	Steel	73,500	February	April	Can. Car. & Fdy.
	20	Tank	11,400g	40	0½	Steel	73,500	May	July	Can. Car. & Fdy.
	6	Tank	11,400g	40	0½	Steel	.....	October	.....	Can. Car. & Fdy.
	18	Tank	9,000g	31	1	Steel	.....	October	.....	Can. Car. & Fdy.
Aluminum Co. of Canada	2	Hopper	140,000	41	1½	St. Underframe	56,900	January	April	Can. Car. & Fdy.
Atlas Steels, Ltd.	15	Ingot	.....	13	0	Steel	19,000	January	July	National Steel
	12	Ingot	.....	13	0	Steel	19,000	July	Feb. '42	National Steel
Canadian Industries, Ltd.	1	Tank	.....	..	..	Steel	36,820	May	July	Can. Car & Fdy.
	8	Tank	.....	30	3	Steel	.....	October	.....	Can. Car & Fdy.
Canadian National	200	Flat	100,000	52	0	St. Underframe	43,700	June	July	Can. Car & Fdy.
	300	Flat	100,000	52	0	St. Underframe	.....	July	.....	Can. Car & Fdy.
	1,100	Box	80,000	40	6	Steel Frame	.....	July	.....	Can. Car & Fdy.
	250	Hopper	140,000	40	8	Steel	48,700	February	Nov.-Feb. '42	Eastern Car Co.
	900	Gondola	140,000	48	6¼	Steel	52,000	June	1942	Eastern Car Co.
	125	Ore	160,000	22	11½	Steel	48,700	February	July	National Steel
	150	Ballast	100,000	40	0	Steel Frame	55,400	February	September	National Steel
	900	Box	80,000	40	6	Steel Frame	44,500	August	1942	National Steel
	100	Refrigerator	100,000	40	0	Steel	.....	February	.....	Company Shops
Canadian Pacific	25	Caboose	.....	28	4⅜	St. Underframe	38,000	April	November	Company Shops
	500	D. S. Box	100,000	40	6	Steel Frame	45,400	June	October	Can. Car & Fdy.
	150	D. S. Auto	80,000	40	4¼	Steel Frame	48,000	May	Jan. '42	National Steel
	200	Hopper	140,000	40	8	Steel	52,000	May	December	National Steel
	50	Hopper	140,000	40	8	Steel	49,000	April	1941	Eastern Car
	100	Refrigerator	80,000	39	3½	Steel Frame	64,500	October	Feb. '42	National Steel
Defence Industries, Ltd.	1	Tank	1,200g	14	0¼	Steel	11,180	March	June	Can. Car & Fdy.
	4	Tank	9,000g	30	1	Steel	52,700	April	August	Can. Car & Fdy.
Dominion Foundry & Steel	12	Flat	80,000	27	0	Steel Frame	.....	November	December	National Steel
Imperial Oil, Ltd.	10	Tank	6,000g	28	0	Steel	49,000	February	August	National Steel
International Nickel Co.	15	Ore	160,000	22	11½	St. Underframe	.....	July	.....	Can. Car. & Fdy.
Newfoundland Railway	50	Box	60,000	35	10¾	Steel Frame	45,400	May	September	Can. Car. & Fdy.
Roberval & Saguenay	4	Ballast	100,000	40	0	Steel Frame	55,400	April	September	National Steel
Steel Co. of Canada	10	Ingot	.....	14	9	Steel	18,000	April	June	National Steel
Sydney & Louisburg	150	Hopper	100,000	30	0	Steel	42,500	April	July	Eastern Car Co.
Toronto, Hamilton & Buffalo	75	Gondola	150,000	48	6¼	Steel	49,500	January	May	National Steel
Welland Chemical	5	Tank	11,400g	36	6	Steel	.....	July	.....	Can. Car & Fdy.

Canada — Export

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of Order	Date of Delivery	Builder
Caroni, Ltd.	60	Cane	18.000	15	0	Steel	11,400	April	August	Can. Car & Fdy.
Geddes, Grant T.	30	Cane	20,000	18	6	Steel	16,340	April	August	Can. Car & Fdy.
South African Railway	1,000	Bogie Wagon	.....	37	0	St. Underframe	.....	April	.....	Can. Car & Fdy.
	1,000	Bogie Wagon	.....	37	0	St. Underframe	.....	July	.....	Can. Car & Fdy.

Locomotive Orders in 1941 Greatest Since 1923

Total of 1,436 purchased for domestic service—large lend-lease orders by War Department featured export market

By Arthur J. McGinnis
Associate Editor

SHARING in the program of new equipment buying inaugurated by the railroads in a determined move to prepare the nation's transportation system to carry the weight of its war effort, orders for new locomotives in 1941 rose to the largest number placed since 1923. Purchases for domestic service numbered 1,436 units, an increase of 724 or more than double the number ordered in 1940. Of this total, 302 were steam, 1,096 Diesel-electric or other internal combustion types and 38 electric. This compares with 207 steam, 492 Diesel and 13 electric locomotives ordered in 1940, and represents increases over that year of 95 steam locomotives or 32 per cent, 604 Diesel locomotives or 123 per cent and 25 electric locomotives. A comparison of 1941 domestic purchases by type of locomotive ordered with other years in the 1929-1941, inclusive, cycle, base period of current *Railway Age* comparisons, is shown in Table I.

Table I—Domestic Orders for Locomotives, 1929-1941

Year	Steam	Diesel	Electric	Total
1941	302	1,096	38	1,436
1940	207	492	13	712
1939	119	249	32	400
1938	36	160	29	225
1937	173	145	36	354
1936	435	77	24	536
1935	30	60	7	97
1934	72	37	76	185
1933	17	25	..	42
1932	5	7	..	12
1931	62	21	91	174
1930	382	18	21	421
1929	1,055	80	95	1,230

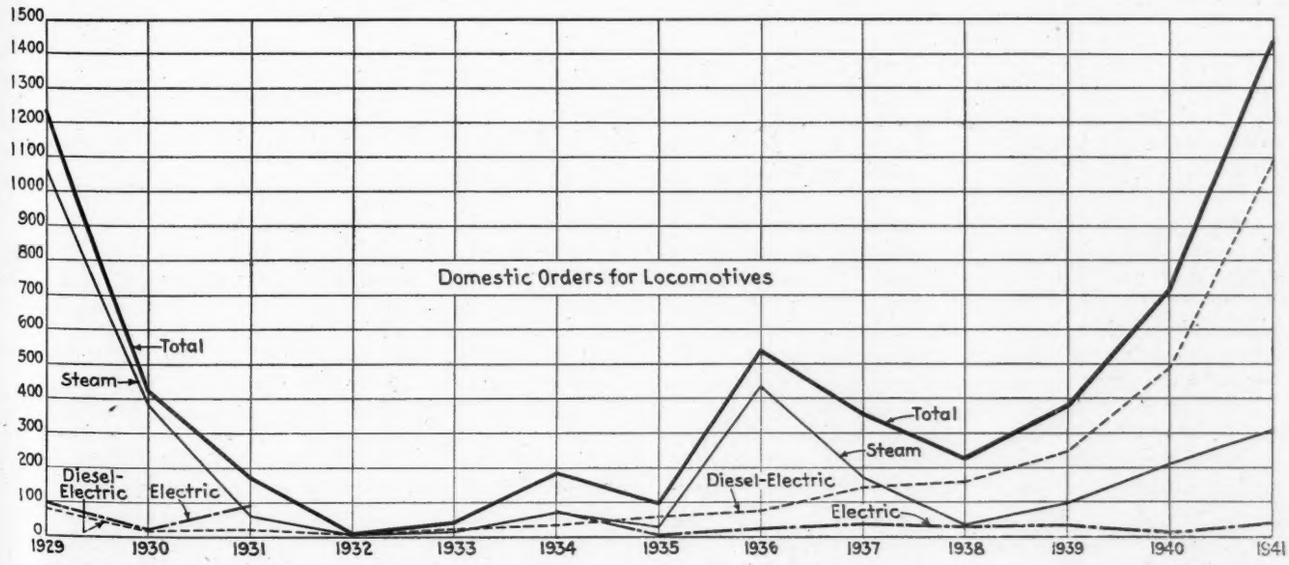
Of the 1,436 locomotives ordered during the year, 1,000 were purchased by railroads, 260 by industrial companies and private car lines and 176 by the United States War and Navy departments. Corresponding 1940 purchases comprised 630 locomotives by the carriers, 73 by industrial companies and private car lines and nine by government departments. A comparison of 1941 and 1940 domestic orders by type of locomotive and by class of buyer is set forth in Table II.

Table II—Domestic Locomotive Orders by Types, and by Class of Buyers

	1941	1940	Increase
Steam:			
Railroads	288	201	87
Industrial Cos.	5	6	(d)1
U. S. Government	9	..	9
Total	302	207	95
Diesel:			
Railroads	684	428	256
Industrial Cos.	245	55	190
U. S. Government	167	9	158
Total	1,096	492	604
Electric:			
Railroads	28	1	27
Industrial Cos.	10	12	(d)2
Total	38	13	25
All Locomotives:			
Railroads	1,000	630	370
Industrial Cos.	260	73	187
U. S. Government	176	9	167
Total	1,436	712	724

(d) Decrease.

The 302 steam locomotives purchased for domestic service represent the largest amount of steam power ordered since 1930, with the single exception of the 435 ordered in 1936. Railroad orders accounted for 288 of the total as compared with 201 placed by the carriers



in the preceding year, and were divided 22 to company shops and 266 to contract builders. The railroads bought steam power chiefly for freight service, 179 units being so classified with 78 intended for freight and passenger service, 21 for passenger service, five for freight and switching service and five for switching service.

Largest domestic steam locomotive order placed during the year and one of the most outstanding in many years from the standpoint of the number and size of the locomotives was the Southern Pacific's $11,000,000 purchase of 50 engines in March. Included in this order were 40 of the road's 4-8-8-2 type cab-ahead engines, among the heaviest and most powerful in the world, for both freight and passenger service on the company's mountain divisions, and ten 4-8-4 streamlined units of the daylight type, for service on fast passenger and merchandise freight trains. Other sizable steam locomotive purchases by railroads from contract builders included two 4-8-4 and eight 4-6-4 type for passenger service, and ten 2-6-6-6 type for freight service by the Chesapeake & Ohio; fifteen 4-6-6-4 type for freight service by the Delaware & Hudson; 25 4-8-4 type for freight service by the Grand Trunk Western; 14 2-8-4 type for freight service by the Louisville & Nashville; fifteen 4-8-2 type for freight service by the New York Central; fifteen 2-8-4 type for freight service by the New York, Chicago & St. Louis; fifteen 4-8-4 type for freight and passenger service by the St. Louis-San Francisco; and twenty 4-6-6-4 and five 4-8-8-4 type for freight service by the Union Pacific. Orders for steam locomotives placed with railroad company shops during the year, all for freight service, comprised 16 2-8-8-2 type by the Norfolk & Western; five 4-8-2 type by the St. Louis-San Francisco; and one 4-6-4-4 by the Pennsylvania. Leading domestic steam locomotive order other than by a railroad comprised eight of the 2-8-0 type for freight service by the United States War Department.

Orders for 1,096 Diesel locomotives during 1941, represent the greatest upsurge in Diesel-power buying in the history of this equipment. The carriers bought 684 as compared with 428 in 1940, industrial companies and private car lines 245 as compared with 55, and the United States War and Navy Departments 167 as compared with nine. Diesel locomotives continued to be sought chiefly for switching service; 583 of the 684 ordered by the railroads were switchers. More significant, however, was the purchase of 100 Diesel-electric locomotives of 2,000 or more horsepower for passenger and freight service, of which 64 were of 4,000 or 5,400 hp.

One of the notable developments of the year was the flood of orders for Diesel switchers by industrial companies and Army and Navy amnunition and supply depots and bases. Although the bulk of these locomotives were of less than 600 hp., purchases ranged as high as units of 1,500 hp. An analysis of orders placed for Diesel-electric and other internal-combustion type locomotives during 1941 and 1940 by horsepower and by class of buyer is presented in Table III.

Leading purchases of Diesel-electric power by the carriers included 18 freight locomotives of 5,400 hp. by the Atchison, Topeka & Santa Fe; nine 2,000-hp. passenger locomotives and six 1,000-hp. switchers by the Atlantic Coast Line; six 5,400-hp. freight and six 4,000-hp. passenger locomotives by the Baltimore & Ohio; 34 locomotives, including two 4,000-hp. and one 2,000-hp. passenger units and nine 1,000-hp., seventeen 600-hp. and five less than 600-hp. switchers by the Chicago & North Western; eighteen 1,000-hp. switchers by the Grand Trunk Western; 23 locomotives, including three 5,400-hp., one 4,050-hp. and one 2,700-hp. freight units, and fifteen 1,000-hp. and three 600-hp. switchers by the Great Northern; eight 4,000-hp. passenger units and twelve 660-hp. switchers by the Louisville & Nashville; 36 locomotives including ten 2,000-hp. passenger and freight units and twenty 660-hp. and six 380-hp. switchers by the New York, New Haven & Hartford; 61 switchers including 45 of 1,000 hp., thirteen of 600 hp. and three of less than 600 hp. by the Southern Pacific; and 25 1,000-hp. switchers by the Union Pacific.

Large purchases of Diesel-electric power by industrial companies included ten 193-hp. Diesel-hydraulic locomotives by the Arundel Corporation; five of 300 hp., three of 400 hp. and two of 150 hp. by the Bates & Rogers Construction Co.; ten of 300 hp. and three of 150 hp. by the Bethlehem Steel Company; two of 500 hp., six of 400 hp., one of 300 hp., and one of 150 hp. by the E. I. DuPont de Nemours Co.; two of 660 hp., three of 300 hp., and six of 150 hp. by the Hunkin-Conkey Construction Company; six of 1,000 hp. by the Michigan Limestone & Chemical Co:; six of 1,500 hp. and eight of 1,000 hp. by the Oliver Iron Mining Com-

Table III—Domestic Diesel Locomotive Orders by Horsepower, and by Class of Buyers

	Railroads		Industrial Cos. and Private Car Lines		United States Government		Totals	
Horsepower:	1941	1940	1941	1940	1941	1940	1941	1940
6,000	..	2	..	..	..	..	..	2
5,400	39	..	..	..	..	..	39	..
4,050	1	..	..	..	..	..	1	..
4,000	24	17	..	..	..	..	24	17
2,700	5	8	..	..	..	..	5	8
2,000	31	42	..	..	..	..	31	42
1,500	1	..	6	..	..	..	7	..
1,000	294	125	21	16	..	..	315	141
600 or 660	204	202	22	7	..	2	226	211
Less than 600	85	32	196	32	167	7	448	71
Total	684	428	245	55	167	9	1,096	492

Table IV—Total Orders for Locomotives, 1929-1941

Year	Domestic*	U. S. Export	Canadian (Incl. Export)	Total
1941	1,436	334	79	1,849
1940	712	85	3	800
1939	400	40	56	496
1938	225	24	35	284
1937	354	56	57	467
1936	536	22	1	559
1935	97	15	27	139
1934	185	17	..	202
1933	42	7	..	49
1932	12	1	1	14
1931	174	28	2	204
1930	421	20	95	536
1929	1,230	106	77	1,413

* For division as between Steam, Diesel and Electric Locomotives, see Table I and chart.

pany; and six of 1,000 hp. and two of 660 hp. by the Tennessee Coal, Iron & R. R. Co.

The 38 electric locomotives ordered in 1941, 28 by railroads and 10 by industrial companies, compares with 13 ordered in 1940. Largest order comprised five passenger units and 15 designed for both passenger and freight-train service placed by the Pennsylvania with the carriers' own shops.

Table V—Locomotives Built, 1929-1941

Year	Domestic	U. S. Export	Canadian	Total
1941	1,047	57	3	1,107
1940	435	66	59	560
1939	338	16	1	355
1938	272	28	46	346
1937	526	44	45	615
1936	157	22	23	202
1935	184	17	4	205
1934	91	19	..	110
1933	57	6	..	63
1932	102	18	3	123
1931	181	17	24	222
1930	972	51	111	1,134
1929	926	139	96	1,161

Large Export Orders Placed

Orders placed in the United States for export during the year totaled 334 locomotives, 248 more than in 1940 and by far the largest number placed for export in the 1929-1941, inclusive, cycle. These orders comprised 273 steam, 39 Diesel and 22 electric locomotives as compared with 55 steam, no Diesel and 30 electric locomotives in the preceding year.

Feature of 1941 export orders and chiefly accountable for the increase over 1940 were 200 steam locomotives purchased by the United States War Department under the Lease-Lend Act for export to an unannounced destination (probably Egypt to replace locomotives transported to the Near East to carry war supplies to Russia). Of the Mikado type, with 2-8-2 wheel arrangement and designed for use on standard-gage tracks, these locomotives will be fueled by oil, develop tractive efforts of 35,000 lb. each and, without tender, weigh 205,000 lb. Complying with urgent instructions of the Government, they will be completed early in 1942.

Included also in lease-lend orders placed by the War Department during the year were 25 meter-gage, coal-burning engines of the 2-8-8-2 type to be exported to China for use primarily on a 275-mile stretch of track between Yunnan and the Burma border. The roadbed of this section of the Burma road is reported to be under construction by the Chinese and the new line will connect with British rails running northward from Rangoon to the Burma-China border. These locomotives will be among the largest and most powerful ever built for narrow-gage tracks and each will develop a tractive effort of 64,600 lb. Boiler pressure is rated at 225 lb. and horsepower at 3,000. Delivery is also expected in 1942. Largest export order other than by the War Department comprised 33 steam locomotives for the

(*Continued on page 123*)

Steam Locomotive Orders in 1941

For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Alaska Railroad	1	4-8-2	Frt. & Pass.	268,000	43,100	22 x 30	May	May '42	Baldwin
Aliquippa & Southern	2	0-8-0	Sw.	231,000	59,500	25 x 28	April	Jan. '42	American
Bessemer & Lake Erie	2	2-10-4	Freight	520,000	96,700	21 x 32	November	1942	Baldwin
	2	0-8-0	Sw.	279,000	64,309	25 x 30	November	1942	American
Bethlehem Steel Co.	1*	Fireless	Sw.	80,000	.....	19 x 16	Dec. '40	May	Heisler
	1	0-6-0	Sw.	.....	.....	.....	September	.....	Vulcan
Chesapeake & Ohio	2	4-8-4	Pass.	504,000	68,300	27½ x 30	January	Jan. '42	Lima
	8	4-6-4	Pass.	442,000	52,000	25 x 30	February	Dec.—1942	Baldwin
	10	2-6-6-6	Freight	695,000	110,200	22½ x 33	October	July '42	Lima
Clinchfield	8	4-6-6-4	Freight	620,000	101,120	22 x 32 (4 cyl.)	June	Sept. '42	American
Conemaugh & Black Lick	2	0-8-0	Freight	230,800	55,400	25 x 28	May	October	Lima
Conn. Light & Power Co.	1	Fireless	Sw.	100,000	.....	21 x 19	January	May	Heisler
Delaware & Hudson	15	4-6-6-4	Freight	597,000	95,800	20½x32(4 cyl.)	July	.....	American
Denver & Rio Grande Western	5	4-6-6-4	Freight	645,000	105,000	23 x 32 (4 cyl)	January	November	Baldwin
Detroit, Toledo & Ironton	4	2-8-2	Freight	369,500	55,600	23 x 30	January	July	Lima
Grand Trunk Western	25	4-8-4	Freight	398,800	59,000	26 x 30	February	Dec.-Mar. '42	American
Humble Oil & Refining Co.	1	Fireless	Sw.	88,000	.....	21 x 19	February	August	Heisler
Louisville & Nashville	14	2-8-4	Freight	438,500	65,290	25 x 32	July	.....	Baldwin
Middle Fork	1	Geared	Sw.	170,000	.....	17¼ x 15	January	April	Heisler
Nashville, Chattanooga & St. Louis	10	4-8-4	Pass. & Frt.	385,000	57,000	25 x 30	June	May '42	American
New York Central	15	4-8-2	Freight	398,000	74,100†	25½ x 30	May	Mar. '42	American
New York, Chicago & St. Louis	15	2-8-4	Freight	423,500	64,100	25 x 34	June	Mar. '42	Lima
Norfolk & Western	6	2-8-8-2	Freight	582,900	126,838C 152,206S	25 & 39 x 32 (4 cyl.)	March	Feb.-July '42	Company Shops
	10	2-8-8-2	Freight	582,900	126,838C 152,206S	25 & 39 x 32 (4 cyl.)	May	Aug. '42-June '43	Company Shops
Ozette Timber Co.	1	Shay	.....	181,000	38,200	13 x 15 (3 cyl.)	September	September	Lima
Panama	6	2-6-0	Pass. & Frt.	155,000	30,000	19 x 24	February	Dec.-1942	Porter
Pennsylvania	20**	.....	Tenders	.....	.....	.....	January	December	Company Shops
	1	4-6-4-4	Freight	580,000	96,250†	23 x 28	February	May	Company Shops
	1	4-8-4	Pass.	493,000	81,500†	Turbine	May	.....	Baldwin
	12**	.....	Tenders	.....	.....	.....	June	May '42	Company Shops
Pere Marquette	12	2-8-4	Freight	442,500	69,350	26 x 34	January	November	Lima
Pickands, Mather & Co.	1	0-8-0	Sw.	260,000	60,100	25 x 28	January	June	Baldwin
Richmond, Fredericksburg & Potomac	6	4-8-4	Pass. & Frt.	409,000	62,800	27 x 30	July	.....	Baldwin
St. Louis-San Francisco	5	4-8-2	Freight	419,200	77,350†	29 x 32	May	Feb. '42	Company Shops
	12	4-8-4	Frt. & Pass.	452,000	69,800	28 x 31	June	.....	Baldwin
	3	4-8-4	Frt. & Pass.	442,000	69,800	28 x 31	June	.....	Baldwin
Southern Pacific	10	4-8-4	Pass.	475,000	64,760	25½ x 32	March	.....	Lima
	40	4-8-8-2	Pass. & Frt.	657,900	124,300	24 x 32 (4 cyl.)	March	.....	Baldwin
Union Electric Co.	1*	Fireless	Sw.	140,000	.....	30 x 26	Oct. '40	February	Heisler
Union Pacific	5	4-8-8-4	Freight	.....	135,375	23¾ x 32 (4 cyl.)	January	December	American
	20	4-6-6-4	Freight	.....	.....	21 x 32	May	1942	American
United States Navy Dept.	1	Fireless	Sw.	.....	90,000	.....	October	.....	Porter
United States War Dept.	8	2-8-0	Freight	178,000	37,100	21 x 26	September	Jan.-Feb. '42	Lima
Wheeling & Lake Erie	10	2-8-4	Freight	415,000	64,135	25 x 34	July	1942	American

†Tractive force including booster.
*1940 totals have been adjusted to include these locomotives which were not reported last year.
**Not included in totals.

United States—Export

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Bethlehem Steel Co. (For A. Thun y Cia., Brazil)	2	2-10-4	Freight	177,000	30,200	17 x 22	March	.....	Baldwin
F.C. del Estado Villazon-Atocha (Bolivia)	4	2-10-2	Freight	195,000	41,000	22 x 24	November	.....	Baldwin
Mysore Iron & Steel Works (India)	1	2-8-2	Freight	66,000	13,300	12 x 18	May	.....	Baldwin
National Railways of Mexico	6	2-8-0	Freight	125,000	26,500	18 x 22	November	.....	Baldwin
	11	4-8-4	Pass.	375,000	51,000	23½ x 30	November	.....	Baldwin
	9	4-8-4	Pass.	375,000	51,000	23½ x 30	November	.....	American
	7	2-6-6-2	Freight	.....	.....	15 x 22	November	.....	American
Standard Fruit & Steamship Co. (Standard R.R.Co., La Geiba, Hon.)	1	2-8-0	.....	.....	.....	17 x 22	1941	.....	American
Sydney & Louisburg	2	2-8-2	Freight	234,000	43,000	22 x 28	March	April	Baldwin
United States War Dept.	60	2-8-2	Freight	205,000	35,000	21 x 28	November	Feb.-May '42	American
	70	2-8-2	Freight	205,000	35,000	21 x 28	November	Feb.-May '42	Baldwin
	70	2-8-2	Freight	205,000	35,000	21 x 28	November	Feb.-May '42	Lima
(Yunnan Burma R.R.)	25	2-8-8-2	Freight	330,000	64,600	18 x 24	November	Apr.-June '42	American
(For Newfoundland)	5	2-8-2	.....	.....	.....	18 x 24	1941	.....	American

Canada

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Canada Starch Co.	1	0-4-0	.....	.....	.....	14 x 22	1941	.....	Montreal
Canadian National	35	4-8-4	Freight	392,220	56,800	25½ x 30	April	.....	Montreal
Canadian Pacific	20	4-6-2	Pass. & Frt.	323,000	45,250	22 x 30	April	Jan.-Sept. '42	Canadian
	17	4-6-2	Pass. & Frt.	323,000	45,250	22 x 30	October	Jan.-Sept. '42	Canadian
Dominion Steel & Coal Corp.	1	0-4-0	.....	.....	.....	14 x 22	1941	.....	Montreal

Canada—Export

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Newfoundland	2	2-8-2	.....	.....	.....	18 x 24	1941	.....	Montreal
Trinidad Government Railways	1	2-8-0	.....	.....	.....	16 x 24	1941	.....	Montreal
	2	4-6-0	.....	.....	.....	16 x 24	1941	.....	Montreal

Electric Locomotives

For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Weight	Horsepower	Date of order	Date of delivery	Builder Electrical Equipment—Locomotive
Inland Lime & Stone Co.	1	.....	Quarry	117,000	1,040	January	November	West.-Differential
Nevada Consolidated Copper Corp.	1	B-B	Sw.	170,000	900	May	.....	General Electric
	2	B-B	Sw.	170,000	900	November	.....	General Electric
New York, New Haven & Hartford	5	2-C+C-2	Freight	500,000	4,860	February	May-July '42	West.-Baldwin
Pennsylvania	5	2-C+C-2	Pass.	468,400	4,620	January	Jan. '42	Company Shops
	15	2-C+C-2	Pass.	468,400	4,620	June	July '42	Company Shops
	1	.....	Pass.	256,000	1,885	February	.....	General Electric
Piedmont & Northern	2	2-B+B-2	Freight	158,000	800	January	Feb. '42	G.E.-Company Shops
Spokane, Portland & Seattle	4	B-B	Sw.	170,000	900	May	.....	General Electric
Utah Copper Co.	1	B-B	Sw.	200,000	900	May	Jan. '42	General Electric
Youngstown Sheet & Tube Co.	1	.....	Sw.	160,000	500	July	.....	General Electric

Export

Purchaser	No.	Wheel arrangement	Service	Weight	Horsepower	Date of order	Date of delivery	Builder Electrical Equipment—Locomotive
Chilean State Railways	7	B-B	Sw.	137,000	450	May	Sept.-Oct. '42	West.-Baldwin
Cia. Salitrea de Tarapoca Y Antofagarta	8	.....	Sw.	80,000	300	August	.....	General Electric
International Nickel Co.	1	B-B	Sw.	130,000	660	July	Apr. '42	General Electric
	1	B-B	Sw.	200,000	900	July	Apr. '42	General Electric
Machino-Import (U.S.S.R.)	5	.....	Sw.	70,000	500	January	.....	General Electric

Diesel-Electric, Gas-Electric and Other Internal-Combustion Locomotives

For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of order	Date of delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Akron & Barberton Belt	1	B-B	Sw.	Diesel-Elec.	220,000	660	October	.....	West.-Baldwin
Akron, Canton & Youngstown, Northern Ohio	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	September	Feb. '42	G. E.-American
Alabama Drydock & Shipbldg. Co.	2	B	Sw.	Diesel-Hyd.	55,000	193	May	.....	Whitcomb
Alabama Great Southern	3	B-B	Sw.	Diesel-Elec.	190,500	660	May	Aug.-Sept.	G. E.-American
Alabama, Tennessee & Northern	1	B-B	Sw.	Diesel-Elec.	88,000	300	May	August	G. E.-Cummins
Alameda Belt Line	2	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
Alan Wood Steel Co.	1	B	Sw.	Diesel Hyd.	88,000	250	November	.....	Whitcomb
Alton	1	2(A1A-A1A)	Pass.	Diesel-Elec.	616,000	4,000	November	Sept. '42	Electro-Motive
Aluminum Co. of America	1	B-B	Sw.	Diesel-Elec.	176,000	650	February	.....	Whitcomb
	3	B	Sw.	Diesel-Elec.	39,600	160	July	.....	Whitcomb
Aluminum Ore Co.	1	B	Sw.	Diesel-Hyd.	44,000	193	May	.....	Whitcomb
American Bridge Co.	2	B-B	Sw.	Diesel-Elec.	90,000	300	November	.....	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	130,000	400	November	.....	G. E.-Cummins
American Car & Foundry Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	October	.....	G. E.-Cummins
American Cast Iron Pipe Co.	1	B-B	Sw.	Diesel-Elec.	160,000	500	January	April	G. E.-Cummins
American Steel & Wire Co.	1	B	Sw.	Diesel-Elec.	99,000	300	September	.....	Whitcomb
Ann Arbor	1*	B-B	Sw.	Diesel-Elec.	85,600	360	Nov. '40	February	West.-Baldwin
Arcade & Attica	1	B-B	Sw. & Frt.	Diesel-Elec.	88,000	380	March	June	G. E.-Cater
Arundel Corp. & Cons. Engrng. Co.	10	B	Sw.	Diesel-Hyd.	66,000	193	July	.....	Whitcomb

*1940 totals have been adjusted to include these locomotives which were not reported last year.

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of order	Date of delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Atchison, Topeka & Santa Fe....	8	B-B	See Note A	Diesel-Elec.	216,000	1,350	March	September	Electro-Motive
	16	4(B-B)	Freight	Diesel-Elec.	920,000	5,400	July	Nov.-Sept.'42	Electro-Motive
	1	A1A-A1A	Pass.	Diesel-Elec.	313,000	2,000	1941	.....	Electro-Motive
Atlanta & St. Andrews Bay.....	3	B-B	Sw.	Diesel-Elec.	230,000	1,000	1941	.....	G. E.-American
Atlantic Coast Line.....	9	A1A-A1A	Pass.	Diesel-Elec.	313,000	2,000	May	Feb.-Apr.'42	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	264,000	1,000	August	December	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	July	Feb. '42	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	August	Mar. '42	Electro-Motive
Atlantic Steel Co.....	1	B-B	Sw.	Diesel-Elec.	110,000	320	January	.....	Whitcomb
Badger & Son, E. P.....	4	B-B	Sw.	Diesel-Elec.	90,000	300	March	July	G. E.-Cummins
Baker Co., J. E.....	1	B	Sw.	Diesel-Hyd.	44,000	200	May	.....	Whitcomb
Baltimore & Ohio.....	6	4(B-B)	Freight	Diesel-Elec.	900,000	5,400	December	.....	Electro-Motive
	4	2(A1A-A1A)	Pass.	Diesel-Elec.	616,000	4,000	March	June-July	Electro-Motive
	2	2(A1A-A1A)	Pass.	Diesel-Elec.	616,000	4,000	December	.....	Electro-Motive
Baltimore & Ohio Chicago Terminal	6	B-B	Sw.	Diesel-Elec.	198,000	600	October	Apr.May'42	Electro-Motive
	4	B-B	Sw.	Diesel-Elec.	250,000	1,000	October	Sept. '42	Electro-Motive
Basic Refractories.....	1	B-B	Sw.	Diesel-Elec.	90,000	300	April	August	G. E.-Cummins
Bates & Rogers Const. Co.....	3	B-B	Sw.	Diesel-Elec.	130,000	400	January	April	G. E.-Cummins
	5	B-B	Sw.	Diesel-Elec.	90,000	300	January	May	G. E.-Cummins
	2	B	Sw.	Diesel-Elec.	46,000	150	January	May	G. E.-Cummins
Belt Ry. Co. of Chicago.....	1	B-B	Sw.	Diesel-Elec.	198,000	660	May	August	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	October	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	198,000	660	October	Mar. '42	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	264,000	1,000	November	Apr. '42	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	October	Sept. '42	Electro-Motive
Bethlehem Steel Co.....	1	B-B	Sw.	Diesel-Elec.	90,000	300	January	April	G. E.-Cummins
	2	B	Sw.	Diesel-Elec.	100,000	300	January	August	G. E.-Cummins
	1	B	Sw.	Diesel-Elec.	40,000	150	January	August	G. E.-Cummins
	1	B	Sw.	Diesel-Elec.	100,000	300	March	September	G. E.-Cummins
	2	B	Sw.	Diesel-Elec.	40,000	150	April	October	G. E.-Cummins
	5	B	Sw.	Diesel-Elec.	110,000	300	May	.....	Whitcomb
	1	B	Sw.	Diesel-Elec.	110,000	300	November	.....	Whitcomb
Bingham & Garfield.....	1	B-B	Sw. & Frt.	Diesel-Elec.	256,000	1,500	November	Jan. '42	G. E.-Cooper-Bess.
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	October	December	G. E.-American
Birmingham Southern.....	2	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
Boston & Maine.....	3	B-B	Sw.	Diesel-Elec.	88,000	380	January	July	G. E.-Cater.
	1	B-B	Sw.	Diesel-Elec.	88,000	380	June	December	G. E.-Cater.
	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	May	Oct.-Nov.	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	198,000	600	May	November	Electro-Motive
Brecon Loading Co.....	1	B-B	Sw.	Diesel-Elec.	130,000	400	June	.....	G. E.-Hercules
	1	B-B	Sw.	Diesel-Elec.	130,000	400	October	.....	G. E.-Hercules
Bridgeport Works.....	1	B-B	Sw.	Diesel-Elec.	90,000	300	August	August	G. E.-Cummins
Bunker Hill & Sullivan Min. & Concg. Co.....	1	B-B	Sw.	Diesel-Elec.	90,000	300	June	.....	G. E.-Cummins
Canton.....	1	B-B	Sw.	Diesel-Elec.	198,000	600	March	October	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	198,000	600	November	1942	Electro-Motive
Carnegie-Illinois Steel Corp.....	4	B-B	Sw.	Diesel-Elec.	140,000	400	November	.....	G. E.-Cummins
Central of Georgia.....	1	B-B	Sw.	Diesel-Elec.	198,000	660	May	October	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	198,000	600	May	Feb. '42	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	May	Feb. '42	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	November	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	220,000	660	January	January	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	264,000	1,000	January	January	West.-Baldwin
Central of New Jersey.....	2	B-B	Sw.	Diesel-Elec.	198,000	600	July	December	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	July	December	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	199,000	660	July	November	G. E.-American
	4	B-B	Sw.	Diesel-Elec.	220,000	660	July	Feb. '42	West.-Baldwin
Central Vermont.....	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	June	Dec.-Jan.'42	G. E. American
Chicago & Eastern Illinois.....	3	B-B	Sw.	Diesel-Elec.	198,000	600	June	Jan. '42	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	197,600	660	June	October	G. E.-American
Chicago & North Western.....	3	B-B	Sw.	Diesel-Elec.	96,800	358	January	July-Sept.	Whitcomb
	1	C	Sw.	Diesel-Mech.	66,000	190	February	August	Whitcomb
	1	B-B	Sw.	Diesel-Elec.	176,000	650	May	Jan. '42	Whitcomb
	1	B-B	Sw.	Diesel-Elec.	96,800	358	September	December	Whitcomb
	12	B-B	Sw.	Diesel-Elec.	198,000	600	December	.....	Electro-Motive
	2	2(A1A-A1A)	Pass.	Diesel-Elec.	616,000	4,000	February	August	Electro-Motive
	1	A1A-A1A	Pass.	Diesel-Elec.	337,000	2,000	February	August	G. E.-American
	3	B-B	Sw.	Diesel-Elec.	198,000	660	March	Apr.-May	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	198,000	660	August	November	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	August	Jan. '42	G. E.-American
	8	B-B	Sw.	Diesel-Elec.	230,000	1,000	December	.....	G. E.-American
Chicago, Burlington & Quincy...	4*	A1A-A1A	Pass.	Diesel-Elec.	314,926	2,000	Dec. '40	1941	Electro-Motive
	5*	B-B	Sw.	Diesel-Elec.	88,850	360	Dec. '40	1941	General Electric
	6*	B-B	Sw.	Diesel-Elec.	199,620	600	Dec. '40	1941	Electro-Motive
	15*	B-B	Sw.	Diesel-Elec.	249,900	1,000	Dec. '40	1941	Electro-Motive
Chicago, Indianapolis & Louisville	3	B-B	Sw.	Diesel-Elec.	250,000	1,000	October	Mar. '42	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	198,000	600	October	Jan. '42	Electro-Motive
Chicago, Milwaukee, St. Paul & Pac.	6	B-B	Sw.	Diesel-Elec.	96,800	380	March	Oct.-1942	West.-Whit.-Cater.
	1	2(A1A-A1A)	Pass.	Diesel-Elec.	660,000	4.000	May	November	G. E.-American
	2	B-B	Frt. & Sw.	Diesel-Elec.	230,000	1,000	May	July	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	88,000	380	July	November	G. E.-Cater.
	2	B-B	Sw.	Diesel-Elec.	90,000	380	March	Jan. '42	West.-D. B.-Cater.
	1	2(A1A-A1A)	Pass.	Diesel-Elec.	616,000	4,000	August	September	Electro-Motive
	1	4(B-B)	Freight	Diesel-Elec.	920,000	5,400	August	November	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	198,000	600	August	September	Electro-Motive
Chicago, Rock Island & Pacific..	5	B	Sw.	Diesel-Elec.	88,000	360	January	Jan.-Feb.	Dav.-Bealer
	2	B-B	Sw.	Diesel-Elec.	237,000	1,000	June	August	G. E.-American
	1	A1A-A1A	Pass.	Diesel-Elec.	336,000	2,000	June	November	G. E.-American
	2	C-C	Pass.	Diesel-Elec.	313,000	2,000	June	Oct.-Nov.	Electro-Motive
	5	C	Sw.	Diesel-Mech.	60,000	180	January	September	West.- D. B.-Cater.
Chicago Short Line.....	1	B-B	Sw.	Diesel-Elec.	264,000	1,000	August	.....	West.-Baldwin
Cincinnati, New Orleans & Texas Pacific.....	2	4(B-B)	Freight	Diesel-Elec.	870,000	5,400	February	May-July	Electro-Motive
	7	B-B	Sw.	Diesel-Elec.	250,000	1,000	May	Dec.-Feb.'42	Electro-Motive
	3	B-B	Sw.	Diesel-Elec.	226,000	1,000	May	November	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	190,000	660	May	September	G. E.-American
Columbia Steel Co.....	1	B	Sw.	Diesel-Elec.	46,000	150	April	July	G. E.-Cummins
Commonwealth Edison Co.....	1	B-B	Sw.	Diesel-Elec.	198,000	600	1941	.....	Electro-Motive
Consolidated Steel Corp.....	1	B	Sw.	Diesel-Elec.	46,000	150	January	April	G. E.-Cummins
Continental Steel Co.....	1	B-B	Sw.	Diesel-Elec.	100,000	300	May	.....	G. E.-Cummins
Day & Zimmermann, Inc.....	1	B-B	Sw.	Diesel-Elec.	220,000	660	March	May	West.-Baldwin
(For U. S. Govt.)	1	B-B	Sw.	Diesel-Elec.	264,000	1,000	February	May	West.-Baldwin
	4	B-B	Sw.	Diesel-Elec.	96,800	380	April	.....	Whitcomb
	1	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
Defense Plant Corp.....	1	B	Sw.	Diesel-Elec.	46,000	150	February	May	G. E.-Cummins
Denver & Rio Grande Western...	3	4(B-B)	Freight	Diesel-Elec.	920,000	5,400	April	Mar. '42	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	88,000	380	April	August	G. E.-Cater.
	9	B-B	Sw.	Diesel-Elec.	220,000	660	May	May-Aug.	West.-Baldwin
	4	B-B	Sw.	Diesel-Elec.	230,000	1,000	April	September	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	1941	.....	Electro-Motive
Detroit Edison Co.....	1	B-B	Sw.	Diesel-Elec.	130,000	400	October	.....	G. E.-Cummins

*1940 totals have been adjusted to include these locomotives which were not reported last year.
Note A—Booster units of 1,350 hp. each for use with control units purchased during 1940.

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of order	Date of delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Detroit, Toledo & Ironton	2	B-B	Sw.	Diesel-Elec.	198,000	600	February	May-Aug.	Electro-Motive
Dewey Portland Cement Co.	1	B-B	Sw.	Diesel-Mech.	96,800	.....	January	.....	Dav.-Besler
Dolese Bros.	2	B	Sw.	Diesel-Elec.	46,000	150	September	October	G. E.-Cummins
Donner-Hanna Coke Corp.	1	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
DuPont de Nemours Co., E. I.	4	B-B	Sw.	Diesel-Elec.	130,000	400	April	October	G. E.-Hercules
	1	B	Sw.	Diesel-Elec.	46,000	150	July	August	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	September	.....	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	160,000	500	September	September	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	130,000	400	October	.....	G. E.-Hercules
	1	B-B	Sw.	Diesel-Elec.	160,000	500	November	.....	G. E.-Cummins
East Erie Commercial	1	B-B	Sw.	Diesel-Elec.	130,000	400	March	Aug.	G. E.-Cummins
Edgewater Steel Co.	1	B-B	Sw.	Diesel-Elec.	100,000	300	October	.....	G. E.-Cummins
Electro-Metallurgical Co.	2	B-B	Sw.	Diesel-Elec.	176,000	500	March	.....	Whitcomb
Elgin, Joilet & Eastern	9	B-B	Sw.	Diesel-Elec.	198,000	600	April	Sept.-Nov.	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	April	August	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	264,000	1,000	May	Aug.-Sept.	West.-Baldwin
Erie City Iron Works	1	B	Sw.	Gas.-Mech.	66,000	190	January	.....	Whitcomb
Federal Barge Lines Co.	1	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
Florida East Coast	3	A1A-A1A	Pass.	Diesel-Elec.	313,000	2,000	May	.....	Electro-Motive
Ford, Bacon & Davis	2	B-B	Sw.	Diesel-Elec.	130,000	400	September	September	G. E.-Cummins
Ft. Worth & Denver City	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	January	October	Electro-Motive
Fraser-Brace Engineering Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	June	September	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	160,000	500	June	September	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	990,000	300	October	.....	G. E.-Cummins
General Electric Co.	1	B	Sw.	Diesel-Elec.	46,000	150	August	August	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	August	.....	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	September	September	G. E.-Cummins
General Tire Eng. Co.	2	B-B	Sw.	Diesel-Elec.	130,000	400	October	.....	G. E.-Cummins
Goodyear Engineering Corp.	2	B-B	Sw.	Diesel-Elec.	130,000	400	April	August	G. E.-Cummins
Grand Trunk Western	15	B-B	Sw.	Diesel-Elec.	250,000	1,000	June	Oct.-1942	Electro-Motive
	3	B-B	Sw.	Diesel-Elec.	230,000	1,000	June	Dec.-Jan.'42	G. E.-American
Great Lakes Steel Corp.	2	B-B	Sw.	Diesel-Elec.	198,000	600	1941	.....	Electro-Motive
Great Northern	2	B-B	Rd.	Diesel-Elec.	213,500	1,000	June	September	Electro-Motive
	1	2(B-B)	Freight	Diesel-Elec.	450,000	2,700	June	October	Electro-Motive
	1	3(B-B)	Freight	Diesel-Elec.	665,000	4,050	June	October	Electro-Motive
	8	B-B	Sw.	Diesel-Elec.	250,000	1,000	June	August	Electro-Motive
	3	B-B	Sw.	Diesel-Elec.	198,000	600	June	September	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	264,000	1,000	June	Sept.-Oct.	West.-Bald.
	1	4(B-B)	Freight	Diesel-Elec.	900,000	5,400	November	July '42	Electro-Motive
	2	B-B	Rd. & Sw.	Diesel-Elec.	213,500	1,000	November	July '42	Electro-Motive
	2	4(B-B)	Freight	Diesel-Elec.	900,000	5,400	October	July '42	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	1941	.....	Electro-Motive
Gulf Coast Lines	3	B-B	Sw.	Diesel-Elec.	88,000	380	February	December	General Electric
Gulf, Mobile & Ohio	3	B-B	Sw.	Diesel-Elec.	230,000	1,000	March	April	G. E.-American
Gulf Shipbldg. Co.	1	B	Sw.	Gasoline-Hyd.	55,000	190	October	.....	Whitcomb
Hercules Powder Co.	1	B-B	Sw.	Diesel-Elec.	160,000	500	January	March	G. E. Cummins
	1	B-B	Sw.	Diesel-Elec.	130,000	400	April	August	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	130,000	400	June	June	G. E.-Cummins
Hooker Electrochemical Co.	1	B	Sw.	Diesel	80,000	250	January	April	Whitcomb-Le Roi
Houston Shipbuilding Corp.	3	B	Sw.	Diesel-Hyd.	66,000	190	February	.....	Whitcomb
Hunkin-Conkey Const. Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	January	May	G. E.-Cummins
	2	B	Sw.	Diesel-Elec.	46,000	150	January	May	G. E.-Cummins
	4	B	Sw.	Diesel-Elec.	46,000	150	February	July	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	90,000	300	October	.....	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
Illinois Central	2	2(A1A-A1A)	Pass.	Diesel-Elec.	616,000	4,000	April	December	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	April	.....	Electro-Motive
Inland Steel Co.	1	B-B	Sw.	Diesel-Elec.	198,000	660	July	September	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	198,000	600	July	December	Electro-Motive
	1	C	Sw.	Diesel-Mech.	140,000	340	July	December	Fate-R. H.-Cooper-Bess.
	1	B	Sw.	Diesel-Mech.	102,000	340	September	Feb. '42	Fate-R. H.-Cooper-Bess.
International Great Northern	2	B-B	Sw.	Diesel-Elec.	198,000	600	February	June	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	88,000	380	February	December	General Electric
J-M Service Corp.	1	B-B	Sw.	Diesel-Elec.	88,000	380	November	.....	G. E.-Cater.
	1	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
Jeffrey Manufacturing Co.	1	B-B	Sw.	Diesel-Elec.	100,000	300	April	August	G. E.-Cummins
Johns-Manville Service Co.	1	B-B	Sw.	Diesel-Elec.	96,800	380	September	.....	Whitcomb
Kansas City Southern	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	April	Sept.-Oct.	Electro-Motive
	2	A1A-A1A	Pass.	Diesel-Elec.	313,000	2,000	April	.....	Electro-Motive
Kansas City Terminal	4	B-B	Sw.	Diesel-Elec.	194,000	660	September	November	G. E.-American
Lehigh Portland Cement Co.	2	B	Sw.	Diesel-Elec.	46,000	150	June	August	G. E.-Cummins
	1	B	Sw.	Diesel-Elec.	46,000	150	August	.....	G. E.-Cummins
Lehigh Valley	3	B-B	Sw.	Diesel-Elec.	88,000	380	June	.....	G. E.-Cater.
Litchfield & Madison	1	B-B	Sw.	Diesel-Elec.	264,000	1,000	October	Feb. '42	West.-Baldwin
Lone Star Defense Corp.	2	B-B	Sw.	Diesel-Elec.	130,000	400	October	.....	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
Los Angeles Junction	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	1941	.....	G. E.-American
Louisiana & Arkansas	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	April	Jan. '42	Electro-Motive
Louisiana Shipyards, Inc.	1	B	Sw.	Diesel-Hyd.	55,000	190	November	.....	Whitcomb
	1	B	Sw.	Diesel-Hyd.	44,000	193	May	.....	Whitcomb
Louisiana Southern	1	B-B	Sw.	Diesel-Elec.	88,000	300	August	.....	G. E.-Cummins
Louisville & Nashville	4	B-B	Sw.	Diesel-Elec.	197,000	660	June	October	G. E.-American
	4	B-B	Sw.	Diesel-Elec.	220,000	660	June	Nov.-1942	West.-Baldwin
	4	B-B	Sw.	Diesel-Elec.	198,000	600	June	December	Electro-Motive
	8	2(A1A-A1A)	Pass.	Diesel-Elec.	616,000	4,000	June	July '42	Electro-Motive
Lukens Steel Co.	2	B	Sw.	Diesel-Elec.	50,000	150	January	May	G. E.-Cummins
Macon, Dublin & Savannah	1	B-B	Sw.	Diesel-Elec.	264,000	1,000	November	.....	West.-Baldwin
Maine Central	1	B-B	Sw.	Diesel-Elec.	88,000	380	May	June	G. E.-Cater.
	1	B-B	Sw.	Diesel-Elec.	88,000	380	June	December	G. E.-Cater.
Manufacturers Railway	3	B-B	Sw.	Diesel-Elec.	230,000	1,000	1941	.....	G. E.-American
Marquette Cement Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	January	May	G. E.-Cummins
Marquette Construction Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	January	July	G. E.-Cummins
Mason Co., Silas	2	B-B	Sw.	Diesel-Elec.	90,000	300	August	October	G. E.-Cummins
Maxon Construction Co.	1	B-B	Sw.	Diesel-Elec.	110,000	300	March	.....	Whitcomb
Michigan Limestone & Chem. Co.	4	B-B	Sw.	Diesel-Elec.	230,000	1,000	1941	.....	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	November	.....	G. E.-American
Midvale Co.	2	B	Sw.	Diesel-Elec.	110,000	320	January	.....	Whitcomb
	1	B	Sw.	Diesel-Hyd.	55,000	193	February	.....	Whitcomb
Minneapolis & St. Louis	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	1941	.....	G. E.-American
Minneapolis, St. Paul & Sault Ste. Marie	1	B-B	Sw.	Diesel-Elec.	88,000	380	April	June	G. E.-Cater.
Minnesota Transfer	3	B-B	Sw.	Diesel-Elec.	198,000	660	February	.....	G. E.-American
Mississippi Export	1	B-B	Sw.	Diesel-Elec.	88,000	380	September	.....	G. E.-Cater
Missouri & Illinois Bridge & Belt	1	B-B	Sw. & Frt.	Diesel-Elec.	88,000	380	April	August	G. E.-Cater.
Missouri Pacific	3	B-B	Sw.	Diesel-Elec.	96,800	386	January	.....	West.-Whit.-Her.
	3	B-B	Sw.	Diesel-Elec.	90,000	386	January	December	West.-D. B.-Her.
	1	B-B	Sw.	Diesel-Elec.	88,000	380	January	Jan. '42	G. E.-Hercules
	1	B-B	Sw.	Diesel-Elec.	198,000	600	January	August	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	220,000	660	January	June-July	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	January	August	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	231,700	1,000	January	July	G. E.-American
	2	2(A1A-A1A)	Pass.	Diesel-Elec.	616,000	4,000	March	October	Electro-Motive
Monarch Cement Co.	1	B-B	Sw.	Diesel-Elec.	100,000	300	January	May	G. E.-Cummins
	1	B	Sw.	Diesel-Elec.	46,000	150	July	July	G. E.-Cummins

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of order	Date of delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Nashville, Chattanooga & St. Louis	2	B-B	Sw.	Diesel-Elec.	198,000	660	May	August	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	220,000	660	June	October	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	264,000	1,000	June	September	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	June	December	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	198,000	600	June	December	Electro-Motive
Newburgh & South Shore	3	B-B	Sw.	Diesel-Elec.	198,000	660	April	June	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	April	June	G. E.-American
New Orleans & Northeastern	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	May	Nov.-Dec.	Electro-Motive
	4	2(B-B)	Freight	Diesel-Elec.	450,000	2,700	October	Oct. '42	Electro-Motive
New Orleans Public Belt	3	B-B	Sw.	Diesel-Elec.	220,000	660	September	December	West.-Baldwin
Newport News Shipbuilding & Dry Dock Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	January	April	G. E.-Cummins
New York Central	1*	B-B	Sw.	Diesel-Elec.	220,000	600	Dec. '40	April	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	220,000	660	June	.....	West.-Baldwin
	7	B-B	Sw.	Diesel-Elec.	198,000	600	June	Jan. '42	Electro-Motive
	7	B-B	Sw.	Diesel-Elec.	140,000	400	June	.....	G. E.-Cummins
New York, Chicago & St. Louis	6	B-B	Sw.	Diesel-Elec.	230,000	1,000	December	.....	G. E.-American
	4	B-B	Sw.	Diesel-Elec.	250,000	1,000	December	.....	Electro-Motive
New York, New Haven & Hartford	10	B-B	Sw.	Diesel-Elec.	199,000	660	March	Apr.-July	G. E.-American
	6	B-B	Sw.	Diesel-Elec.	88,000	380	April	September	G. E.-Cater.
	10	A1A-A1A	Pass. & Frt.	Diesel-Elec.	435,000	2,000	May	Dec.-Apr.'42	G. E.-American
	10	B-B	Sw.	Diesel-Elec.	199,000	660	November	.....	G. E.-American
New York, Ontario & Western	5	B-B	Sw.	Diesel-Elec.	88,000	380	June	Dec.-Jan.'42	G. E.-Cater.
N. Y., Susquehanna & Western	8	B-B	Sw.	Diesel-Elec.	230,000	1,000	July	Dec.-1942	G. E.-American
No. Carolina Shipbuilding Co.	2	B-B	Sw.	Diesel-Elec.	90,000	300	February	May	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	April	August	G. E.-Cummins
Northeast Oklahoma	1	B-B	Frt. & Sw.	Diesel-Elec.	160,000	500	December	Apr. '42	G. E.-Cummins
Northern Pacific	3	B-B	Sw.	Diesel-Elec.	250,000	1,000	January	June	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	January	March	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	264,000	1,000	January	May-June	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	December	.....	G. E.-American
Northern Pacific Term. Co. of Ore.	3	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
Ohio & Morenci	1	B-B	Sw.	Diesel-Elec.	70,000	300	June	Feb. '42	West.-D. B.-Cater.
Oliver Iron Mining Co.	6	B-B	Sw.	Diesel-Elec.	264,000	1,000	November	.....	West.-Baldwin
	6	B-B	Sw.	Diesel-Elec.	264,000	1,500	December	.....	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	November	.....	G. E.-American
Oregon Shipbuilding Corp.	2	B	Sw.	Diesel-Elec.	50,000	150	November	.....	G. E.-Cummins
Patapsco & Back Rivers	1	B-B	Sw.	Diesel-Elec.	264,000	1,000	May	August	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	220,000	660	May	August	West.-Baldwin
Pennsylvania	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	March	October	Electro-Motive
	1	2(A1A-A1A)	Pass.	Diesel-Elec.	616,000	4,000	December	.....	Electro-Motive
Pennsylvania Forge Co.	1	B	Sw.	Gas.-Mech.	55,000	190	February	.....	Whitcomb
Peoria & Pekin Union	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	March	March	G. E.-American
Pere Marquette	1	B-B	Sw.	Diesel-Elec.	198,000	600	November	Mar.'42	Electro-Motive
	4	B-B	Sw.	Diesel-Elec.	250,000	1,000	November	Aug. '42	Electro-Motive
Permanente Corp. (California)	1	B-B	Sw.	Diesel-Elec.	130,000	400	March	May	G. E.-Cummins
Phila., Bethlehem & New England	2	B-B	Sw.	Diesel-Elec.	198,000	600	1941	.....	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	250,000	1,000	1941	.....	Electro-Motive
Phoenix Iron Company	1	B	Sw.	Diesel-Elec.	55,000	160	November	.....	Whitcomb
Portland Terminal	1	B-B	Sw.	Diesel-Elec.	199,000	660	May	May	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	230,000	1,000	May	September	G. E.-American
Proctor & Gamble	4	B-B	Sw.	Diesel-Elec.	90,000	300	March	July	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	August	October	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
(P. & G. Defense Corp.)	1	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
Pullman	2	B-B	Sw.	Diesel-Elec.	199,000	660	May	August	G. E.-American
Pullman-Standard Car Mfg. Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	April	August	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	June	.....	G. E.-Cummins
Reading	2	B-B	Sw.	Diesel-Elec.	199,000	660	June	August	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	198,000	600	June	November	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	June	October	Electro-Motive
	4	B-B	Sw.	Diesel-Elec.	220,000	660	June	Sept.-Oct.	West.-Baldwin
Remington Arms Co.	1	B-B	Sw.	Diesel-Elec.	90,000	300	January	May	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	130,000	400	April	July	G. E.-Hercules
	1	B-B	Sw.	Diesel-Elec.	90,000	300	October	.....	G. E.-Cummins
Republic Mining & Mfg. Co.	3	B	Sw.	Diesel-Hyd.	44,000	193	May	.....	Whitcomb
Republic Steel Co.	1	B-B	Sw.	Diesel-Elec.	160,000	500	April	August	G. E.-Cummins
Richmond, Fredericksburg & Potomac	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	July	Jan. '42	G. E.-American
Roebling's Sons Co., John A.	1	B	Frt. & Sw.	Diesel-Mech.	66,000	190	February	August	West.-Whitcomb
St. Louis-San Francisco	2	B-B	Sw.	Diesel-Elec.	90,000	380	March	Jan. '42	Dav.-Besler
	5	B-B	Sw.	Diesel-Elec.	264,000	1,000	July	Nov.-Dec.	West.-Baldwin
St. Paul Union Depot	1	B-B	Frt. & Sw.	Diesel-Elec.	88,000	380	February	May	G. E.-Cater.
San Antonio, Uvalde & Gulf	1	B-B	Sw.	Diesel-Elec.	220,000	660	January	June-July	West.-Baldwin
Sanderson & Porter	1	B-B	Sw.	Diesel-Elec.	160,000	500	January	July	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	160,000	500	May	August	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
Scullin Steel Co.	1	B	Sw.	Diesel-Elec.	110,000	320	March	.....	Whitcomb
Seaboard Air Line	2	A1A-A1A	Pass.	Diesel-Elec.	313,000	2,000	July	Dec.-May'42	Electro-Motive
	3	4(B-B)	Freight	Diesel-Elec.	900,000	5,400	July	Oct.-Nov.'42	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	July	December	Electro-Motive
	3	B-B	Sw.	Diesel-Elec.	230,000	1,000	July	November	G. E.-American
	3	B-B	Sw.	Diesel-Elec.	264,000	1,000	July	Sept.-Nov.	West.-Baldwin
Sheffield Steel Corp.	3	B-B	Sw.	Diesel-Elec.	100,000	300	April	.....	G. E.-Cummins
Sheffield Steel Corp. of Texas	2	B	Sw.	Diesel-Elec.	110,000	320	April	.....	Whitcomb
Sherwin-Williams Defense	2	B-B	Sw.	Diesel-Elec.	96,800	380	October	.....	Whitcomb
	2	B-B	Sw.	Diesel-Elec.	198,000	660	November	.....	G. E.-American
South Buffalo	3	B-B	Sw.	Diesel-Elec.	230,000	1,000	1941	.....	G. E.-American
Southern	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	May	October	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	190,000	660	May	August	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	264,000	1,000	June	October	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	220,000	660	June	October	West.-Baldwin
Southern Pacific	3	B-B	Sw.	Diesel-Elec.	88,000	380	October	.....	G. E.-Cater.
	2	B-B	Sw.	Diesel-Elec.	220,000	660	February	March	West.-Baldwin
	5	B-B	Sw.	Diesel-Elec.	264,000	1,000	March	June-July	West.-Baldwin
	5	B-B	Sw.	Diesel-Elec.	264,000	1,000	September	.....	West.-Baldwin
	7	B-B	Sw.	Diesel-Elec.	198,000	600	1941	.....	Electro-Motive
	10	B-B	Sw.	Diesel-Elec.	250,000	1,000	1941	.....	Electro-Motive
	4	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
	25	B-B	Sw.	Diesel-Elec.	230,000	1,000	1941	.....	G. E.-American
Spokane, Coeur D'Alene & Palouse	3	B-B	Sw.	Diesel-Elec.	250,000	1,000	October	Apr. '42	Electro-Motive
Spokane, Portland & Seattle	2	B-B	Sw.	Diesel-Elec.	198,000	660	July	October	G. E.-American
Steelton & Highspire	2	B-B	Sw.	Diesel-Elec.	140,000	.....	February	September	G.E.-Cummins
Stone & Webster Engrng. Co.	2	B-B	Sw.	Diesel-Elec.	176,000	500	February	.....	Whitcomb
Tennessee Central	1	B-B	Sw.	Diesel-Elec.	199,000	660	October	November	G. E.-American
Tennessee Coal, Iron & R. R. Co.	4	B-B	Sw.	Diesel-Elec.	230,000	1,000	January	February	G. E.-American
	2	B-B	Freight	Diesel-Elec.	230,000	1,000	January	Apr.-May	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	199,000	660	November	.....	G. E.-American
Tennessee Products Corp.	1	B-B	Sw.	Diesel-Elec.	90,000	300	November	.....	G. E.-Cummins
Terminal R. R. Assoc. of St. Louis	3	B-B	Sw.	Diesel-Elec.	230,000	1,000	July	Nov.-Dec.'42	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	198,000	660	July	Nov.-Dec.'42	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	264,000	1,000	April	July	West.-Baldwin
	2	B-B	Sw.	Diesel-Elec.	220,000	660	August	.....	West.-Baldwin

*1940 totals have been adjusted to include these locomotives which were not reported last year.

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of order	Date of delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Term. R.R. Assoc. of St. Louis (Cont.)	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	November	.....	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	November	.....	G. E.-American
	3	B-B	Sw.	Diesel-Elec.	264,000	1,000	August	December	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	264,000	1,000	November	.....	West.-Baldwin
	3	B-B	Sw.	Diesel-Elec.	250,000	1,000	1941	August	Electro-Motive
	3	B-B	Sw.	Diesel-Elec.	230,000	1,000	1941	.....	G. E.-American
Texas & New Orleans	1	B-B	Sw.	Diesel-Elec.	198,000	600	February	August	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	197,800	600	March	April	G. E.-American
Texas Pacific-Mo. Pacific Term. R. R. of New Orleans	1	B-B	Sw.	Diesel-Elec.	198,000	660	1941	.....	G. E.-American
Tidewater Assn. Oil Co.	1	B	Sw.	Diesel-Elec.	46,000	150	August	August	G. E.-Cummins
Timken Roller Bearing	1	B-B	Sw.	Diesel-Elec.	130,000	400	July	.....	G. E.-Cummins
Todd California Shipbldg. Corp.	2	B	Sw.	Diesel-Elec.	46,000	150	January	May	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	130,000	400	August	September	G. E.-Cummins
Union Carbide Co.	1	B-B	Sw.	Diesel-Elec.	99,000	300	March	.....	Whitcomb
Union Pacific	25	B-B	Sw.	Diesel-Elec.	250,000	1,000	August	1942	Electro-Motive
Union Railroad	4	B-B	Sw.	Diesel-Elec.	264,000	1,000	April	July-Aug.	West.-Baldwin
	6	B-B	Sw.	Diesel-Elec.	240,000	1,000	May	Aug.-Sept.	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	240,000	1,000	November	May '42	G. E.-American
	5	B-B	Sw.	Diesel-Elec.	250,000	1,000	November	Sept. '42	Electro-Motive
United States Navy Dept.	1	B-B	Sw.	Diesel-Elec.	100,000	300	January	March	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	100,000	300	February	May	G. E.-Cummins
	3	B-B	Sw.	Diesel-Elec.	100,000	300	March	July	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	100,000	300	April	August	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	100,000	300	May	October	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	100,000	300	June	October	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	100,000	300	September	.....	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	160,000	500	November	.....	G. E.-Cummins
	3	B-B	Sw.	Diesel-Elec.	99,000	300	March	.....	Whitcomb
	1	B-B	Sw.	Diesel-Elec.	176,000	500	November	.....	Whitcomb
	1	B-B	Sw.	Diesel-Elec.	110,000	300	November	.....	Whitcomb
	1	....	Sw.	Diesel-Elec.	.....	....	December	.....	Whitcomb
	4	....	Sw.	Diesel-Mech.	66,000	180	February	.....	Vulcan
	6	....	Sw.	Diesel-Elec.	90,000	300	February	.....	Vulcan
	2	....	Sw.	Diesel-Elec.	.....	....	June	.....	Vulcan
	3	....	Sw.	Diesel-Elec.	90,000	300	March	.....	Porter
	2	....	Sw.	Diesel-Elec.	100,000	....	May	.....	Porter
	2	....	Sw.	Diesel-Elec.	90,000	....	December	.....	Porter
	1	....	Sw.	Diesel-Elec.	66,000	....	October	.....	Fate-Root-Heath
	1	....	Sw.	Diesel-Elec.	.....	....	December	.....	Fate-Root-Heath
	1	....	Sw.	Diesel-Elec.	100,000	....	April	.....	Atlas
	1	....	Sw.	Diesel-Elec.	100,000	....	July	.....	Atlas
	1	....	Sw.	Diesel-Elec.	50,000	....	November	.....	Atlas
	4	B-B	Sw.	Diesel-Elec.	100,000	300	December	1942	General Electric
	1	B-B	Sw.	Diesel-Elec.	130,000	400	December	1942	General Electric
United States War Dept.	4	B-B	Sw.	Diesel-Elec.	90,000	300	January	November	G. E.-Cooper-Bess.
	3	B-B	Sw.	Diesel-Elec.	120,000	400	January	November	G. E.-Cooper-Bess.
	1	B-B	Sw.	Diesel-Elec.	86,000	300	February	February	G. E.-Cummins
	6	B-B	Sw.	Diesel-Elec.	90,000	300	February	July	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	May	September	G. E.-Cummins
	4	B-B	Sw.	Diesel-Elec.	120,000	400	May	.....	G. E.-Cooper-Bess.
	2	B-B	Sw. & Frt.	Diesel-Elec.	88,000	380	July	July	G. E.-Cater.
	1	B-B	Sw.	Diesel-Elec.	90,000	300	July	.....	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	130,000	400	July	September	G. E.-Cummins
	2	B-B	Sw.	Diesel-Elec.	90,000	300	August	.....	G. E.-Cummins
	1	B	Sw.	Diesel-Elec.	46,000	150	October	October	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	90,000	300	November	.....	G. E.-Cummins
	5	B	Sw.	Gas.-Mech.	44,000	190	January	.....	Whitcomb
	10	B	Sw.	Gas.-Mech.	44,000	190	July	.....	Whitcomb
	2	B-B	Sw.	Diesel-Elec.	96,800	386	June	.....	Whitcomb
	1	B-B	Sw.	Diesel-Elec.	99,000	250	June	.....	Whitcomb
	2	B-B	Sw.	Diesel-Elec.	130,000	400	September	October	G. E.-Cummins
	9	B-B	Sw.	Diesel-Elec.	90,000	390	May	Jan. '42	West.-D. B.-C.-Bess.
	10	B	Sw.	Gas.-Mech.	40,000	170	January	1941	Dav.-Bes.-Le Roi
	5	B	Sw.	Gas.-Mech.	40,000	170	July	Dec.-Jan. '42	Dav.-Bes.-Le Roi
	5	B	Sw.	Diesel-Elec.	70,000	250	February	September	G. E.-D. B.-Cummins
	2	B	Sw.	Diesel-Elec.	60,000	....	February	.....	Dav.-Besler
	5	B-B	Sw.	Gas.-Mech.	40,000	....	July	.....	Dav.-Besler
	10	....	Sw.	Gas.-Mech.	40,000	....	January	.....	Plymouth
	10	....	Sw.	Gas.-Mech.	40,000	....	February	.....	Plymouth
	5	....	Sw.	Diesel-Elec.	90,000	....	January	.....	Vulcan
	5	B	Sw.	Gas.-Mech.	40,000	170	July	Dec.-Jan. '42	Vulcan-Le Roi
	1	B-B	Sw.	Diesel-Elec.	90,000	150	September	Feb. '42	West.-Vul.-Cum.
	1	B-B	Sw.	Diesel-Elec.	120,000	400	October	Oct. '42	West.-Vul.-F. M.
	1	B	Sw.	Gas.-Mech.	.....	....	January	August	Midwest-Waukesha
	2	B	Sw.	Diesel-Elec.	40,000	170	June	December	Fate R. H.-Cater.
Upper Merion & Plymouth	1	B-B	Sw.	Diesel-Elec.	160,000	500	October	.....	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	220,000	660	October	.....	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	220,000	660	April	July	West.-Baldwin
Vanadium Corp. of America	1	B	Sw.	Diesel-Mech.	66,000	210	January	.....	Whitcomb
Wabash	1	B-B	Sw.	Diesel-Elec.	220,000	660	May	July	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	198,000	600	May	November	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	197,000	660	May	July	G. E.-American
	1	B-B	Sw.	Diesel-Elec.	197,000	660	August	December	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	December	.....	G. E.-American
Wabash Portland Cement Co.	1	B	Sw.	Diesel-Mech.	55,000	190	January	.....	Whitcomb
Walsh Construction Co.	1	B	Sw.	Diesel-Elec.	55,000	300	April	.....	Whitcomb
	1	B	Sw.	Diesel-Elec.	50,600	150	June	.....	Whitcomb
Washington & Old Dominion	3	B-B	Sw.	Diesel-Elec.	88,000	380	August	.....	G. E.-Cater.
Western Maryland	1	B-B	Sw.	Diesel-Elec.	220,000	660	June	September	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	198,500	660	June	September	G. E.-American
Western Pacific	3	4 (B-B)	Freight	Diesel-Elec.	920,000	5,400	June	December	Electro-Motive
	8	B-B	Sw.	Diesel-Elec.	199,000	660	October	Feb.-Mar. '42	G. E.-American
Westinghouse Elec. & Mfg. Co.	1	B-B	Sw.	Diesel-Elec.	110,000	320	Feburary	.....	Whitcomb
	1	B-B	Sw.	Diesel-Elec.	110,000	300	May	.....	Whitcomb
Wheeling & Lake Erie	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	March	July-Aug.	Electro-Motive
Wickwire Bros.	1	B	Sw.	Diesel-Elec.	46,000	150	July	October	G. E.-Cummins
Wisconsin Central	2	B-B	Sw.	Diesel-Elec.	230,000	1,000	1941	.....	G. E.-American
Youngstown Sheet & Tube Co.	1	....	Sw.	Gasoline	50,000	175	Feburary	December	Plymouth
	1	B-B	Sw.	Diesel-Elec.	160,000	500	July	.....	G. E.-Cummins

Export

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of order	Date of delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Aluminum Co. of Canada	1	B-B	Sw.	Diesel-Elec.	100,000	300	April	August	G. E.-Cummins
	1	B-B	Sw.	Diesel-Elec.	100,000	300	June	October	G. E.-Cummins
	4	B	Sw.	Diesel-Elec.	39,600	160	June	.....	Whitcomb
Canadian Furnace	2	B	Sw.	Diesel-Mech.	70,000	250	April	December	Dav.-Besler-Cummins
Canadian Pacific Munitions, Ltd.	1	B-B	Sw.	Diesel-Elec.	198,000	660	December	.....	G. E.-American
General Supply Co. of Canada	1	B	Sw.	Diesel-Hyd.	66,000	190	July	.....	Whitcomb
Iran	24	B	Sw.	Diesel-Mech.	50,000	190	October	1942	Dav.-Besler-Cater.
Leste Brazeleiro, Brazil	1	B	Sw.	Diesel-Mech.	50,000	190	July	Feb. '42	Dav.-Besler-Cater.
Mexican Government Railroad	1	B-B	Sw.	Diesel-Elec.	88,000	380	June	.....	G. E.-Cater.
	2	B-B	Sw.	Diesel-Elec.	88,000	380	August	.....	G. E.-Cater.
Robergal & Saguenay	1	B-B	Sw.	Diesel-Elec.	110,000	386	January	.....	Whitcomb

Passenger Cars Ordered in 1941

Total of 548 cars purchased for domestic service is largest since 1937—Deliveries restricted by lack of priorities rating

By Arthur J. McGinnis

Associate Editor

ORDERS for passenger-train cars placed with contract car builders and railroad company shops for service in the United States during the year 1941 totaled 548 cars. This compares with 389 cars purchased in 1940, an increase of 159 cars or 41 per cent, and represents the largest yearly volume placed during the past decade, 1931-1941, inclusive, with the single exception of the 679 cars ordered in 1937. The increase of 159 cars over 1940 is attributable chiefly to the larger volume of sleeping cars ordered by the Pullman Company, 178 in 1941 as against 53 in 1940, an increase of 125 cars.

Most of the buying occurred during the early months of the year, 494 cars of the total of 548 being placed during the first six months. An additional 40 cars were ordered in July and but 14, including ten from a railroad's own shop, in the remaining five months, during which deliveries became uncertain due to the placing of priority ratings on many of the materials used in passenger-train car construction, diverting these materials to other purposes. The comparatively heavy purchases of the first six months continued a wave of passenger-car equipment buying inaugurated by the railroads in the last six months of 1940, during which 326 of the 389 cars ordered in that year were placed. Thus during the 12-month period, July, 1940, to June, 1941, inclusive, a total of 820 cars were ordered.

Table I—Passenger-Train Car Orders in 1941

For service in the United States	548
For export from the United States	19
For service in Canada	72
Grand total	639

In addition to the 178 sleeping cars, 1941 purchases chiefly included 192 coaches, 26 diners and 117 cars for express, baggage or mail service. Orders were allocated, 40 cars to railroad company shops and 508 to contract car builders. Only ten of the 389 cars ordered in 1940 were placed with the railroads' own shops, four by the Delaware, Lackawanna & Western, and six by the Missouri Pacific. Company shop orders in 1941 included 19 coaches and two coach-baggage cars by the Chicago, Milwaukee, St. Paul & Pacific; five M. U. motor-coaches and five trailer-coaches by the Long Island; four mail, one baggage-express and one business car by the Missouri Pacific; and three coaches by the Pennsylvania.

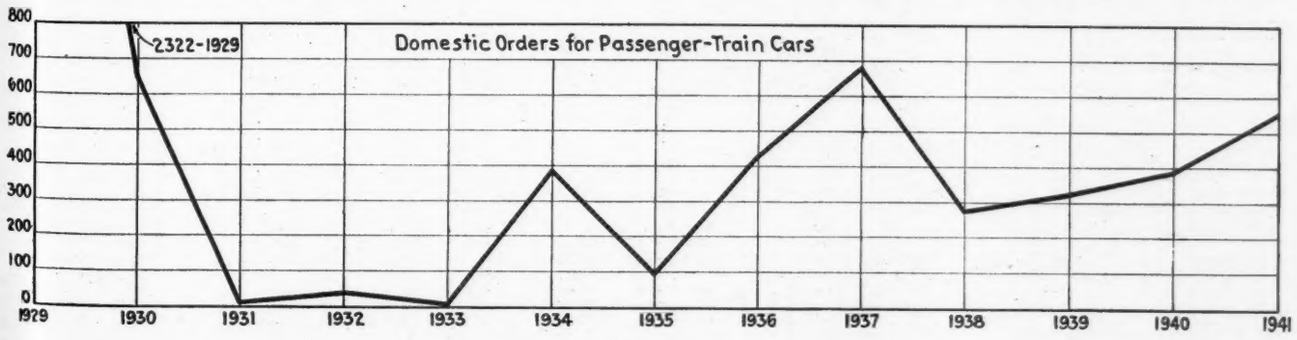
Large purchases from car builders included 59 cars of various types by the Atchison, Topeka & Santa Fe, 16 by the Atlantic Coast Line, 25 by the Chicago & North Western, and 32 by the New York Central (95 additional cars were ordered by this road in December, 1940); 70 cars (including 30 chair, 30 baggage and 10 mail-baggage) by the Union Pacific, 25 baggage-express cars by the Southern, 20 coaches by the Chesapeake & Ohio and 15 coaches by the Norfolk & Western. The United States War Department ordered five coaches in 1941 as compared to seven cars for hospital service in 1940. The War Department also had pending at the close of the year inquiries for 33 narrow-gage cars, including 16 coaches, two dining, five sleeping, three baggage, three mail and four express cars, and two standard-gage cars, including one coach and one passenger-baggage car, the materials for which were reported to receive an A-1-c priority rating. Other orders are presented in detail in the appended tables which list the class, length, seating capacity, weight, date of order, date of delivery and builder of each car.

Table II—Orders for Passenger-Train Cars 1929-1941

Year	Domestic (A)	U. S. Export	Canadian	Total
1941	548	19	72	639
1940	389	21	65	475
1939	320	28	87 (Inc. export)	435
1938	274	..	24	298
1937	679	..	99	778
1936	425	..	10	435
1935	95	..	16	111
1934	388	15	..	403
1933	6	..	..	6
1932	39	..	..	39
1931	11	21	11	43
1930	648	15	203	866
1929	2,322	33	122	2,477

(A)—In certain instances domestic orders placed in December are not reported until following year. Statistics for years 1929-1940 are adjusted to eliminate this overlap.

Comprehended in the above statistics are all revenue passenger-train cars, including separate members of articulated units, but excluding those containing power plants. These latter are listed as rail-motor cars. So-



called "cars," devoted entirely to the housing of power plant facilities, and without space for revenue traffic, are listed under "locomotives" and published elsewhere in this issue.

During 1941, one rail-motor car was ordered for domestic service, by the Missouri Pacific, as against eight ordered in 1940, four by the Denver & Rio Grande Western and four by the Illinois Central. No foreign orders for rail-motor cars were reported in 1941 as compared with 26 ordered for export in 1940.

The foreign passenger-train car order reported during the year comprised 19 coaches for export to Mozambique, Portuguese East Africa. This compares with 21 coaches ordered for export in 1940. Pending in the American market at the year's end, were inquiries for a total of 122 all-steel, light-weight cars for the National Railways of Mexico, including sixteen 70-ft. first-class coaches, sixty-four 70-ft. second-class coaches, 20 express, 20 mail-baggage and two business cars.

Table III—Passenger-Train Cars Built 1929-1941

Year	Domestic	U. S. Export	Canadian	Total
1941	299	8	32	339
1940	142	28	30	200
1939	194	..	27 (Inc. export)	221
1938	264	..	38	302
1937	664	..	70	734
1936	142	..	10	152
1935	197	..	..	197
1934	268	15	..	283
1933	6	..	..	6
1932	39	..	..	39
1931	198	21	66	285
1930	1,264	40	210	1,514
1929	1,254	20	162	1,436

The Canadian National ordered 25 coaches, 15 baggage and seven mail cars from Canadian car builders in 1941 as compared with 25 baggage and five express-mail cars in the preceding year; and the Canadian Pacific, 25 coaches from its own shops as against a like number of coaches from its shops and ten express-baggage cars from a car builder in 1940.

Passenger-train car building during the year failed to keep pace with the increased volume of orders—due chiefly to shortages of critical materials. Builders were handicapped by the lack of a priorities rating for materials for passenger-car construction. This was reflected in dwindling orders during the later months of the year and clouds the outlook for new passenger-car buying during 1942. Deliveries in 1941 totaled 299 cars for domestic service and eight for export as compared with 142 for domestic service and 28 for export in 1940. Delivery expectations as reported in the appended tables, however, indicate large numbers of cars scheduled for completion during the early months of 1942, including some which were ordered back in 1940. Five rail-motor cars were built for domestic service during the year and 21 for export. Canadian builders reported completion of 32 cars in 1941 as against 30 in 1940.

The appended tables of orders placed were compiled from information supplied by the railroads, which has been checked against lists of orders received by car builders, this latter data being made available through the courtesy of the American Railway Car Institute.

Passenger-Train Car Orders in 1941

For Service in the United States

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Atchison, Topeka & Santa Fe	1	Lunch-Ctr.-Diner	83	0	38	120,160	March	December	Budd
	2	Diner	83	0	36	116,900	March	December	Budd
	6	Club-Lounge	79	8	27	108,100	May	Dec.-Apr. '42	Budd
	16	Chair	83	10	52	111,790	May	Dec.-Apr. '42	Budd
	5	Bag.-Mail	73	8	..	92,950	April	Dec.-Apr. '42	Budd
	14	Bag.-Mail-Storage	73	1¾	..	89,830	April	Dec.-Apr. '42	Budd
	8	Diner	83	0	36	117,140	May	Dec.-Apr. '42	Budd
	7	Mail-Storage	73	1¾	..	89,830	May	Dec.-Apr. '42	Budd
Atlantic Coast Line	5 AC	Coach	85	0	56	108,820	May	Feb. '42	Budd
	2 AC	Diner	85	0	48	116,120	May	Mar. '42	Budd
	1 AC	Din.-Lounge	85	0	42	117,055	May	Mar. '42	Budd
	2 AC	Lounge-Obs.	85	0	56	108,655	May	Mar. '42	Budd
	3 AC	P.-Bag.-Dorm.-L.	85	0	21	108,705	May	Mar. '42	Budd
	3 AC	Coach	85	0	48	108,870	May	Feb. '42	Budd
Chesapeake & Ohio	20	Coach	71	11	78	142,000	February	Apr. '42	Amer. Car & Fdy.
Chicago & North Western	1	Bag.-Tap Rm.	82	0	36	126,073	February	November	Pullman-Standard
	15	Coach	82	3	64	113,487	February	Oct.-Nov.	Pullman-Standard
	1	Coach	82	3	56	114,224	February	October	Pullman-Standard
	3	Diner	82	8	35	122,386	February	November	Pullman-Standard
	2	Parlor	82	3	35	112,848	February	November	Pullman-Standard
	2	Bag.-M.-Tav.	82	0	25	123,497	February	November	Pullman-Standard
	1	Bag.-M.-Tav.	82	0	25	120.634	February	November	Pullman-Standard
Chicago, Indianapolis & Louisville	7	Express	70	9	..	115.000	July	Jan.-Mar. '42	St. Louis Car
Chicago, Milwaukee, St. Paul & Pacific	19	Coach	82	3	68	113,000	March	May '42	Company Shops
	2	Coach-Bag.	82	3	40	112,000	March	May '42	Company Shops
Chicago, Rock Island & Pacific	7	Coach	83	10	54	108,415	March	August	Budd
	3	Diner	83	0	48	113,535	May	Feb. '42	Budd
Erie	7	Exp-Bag.	70	8½	..	131,600	May	Apr. '42	Amer. Car & Fdy.
Florida East Coast	1	Pass.-Bag.-Dorm.	85	0	21	108,805	May	.....	Budd
	1	Diner	85	0	48	116,220	May	.....	Budd
	1	Tav.-Obs.	85	0	56	108,155	May	.....	Budd
	3	Chair	85	0	56	108,370	May	.....	Budd
Illinois Central	2	Diner	84	6	48	128,667	April	Mar. '42	Pullman-Standard
Louisville & Nashville	3 AC	Coach	85	0	56	108,240	August	May '42	Budd
Long Island	5	M. U. Motor Coach	80	3¼	134	120,000	September	.....	Company Shops
	5	Trailer-Coach	80	3¼	130	94,000	September	.....	Company Shops
Missouri Pacific	4	Mail	60	0	..	.....	January	Jan. '42	Company Shops
	1 AC	Business	72	6	10	177,500	January	October	Company Shops
	1	Bag.-Exp.	74	0	..	.....	January	July '42	Company Shops
	1	Mail-Storage	73	2	..	89,280	May	Feb. '42	Budd
	2	Bag.-Exp.	73	2	..	89,280	May	Feb. '42	Budd
	2	Mail-Bag.	73	2	..	92,150	May	Feb. '42	Budd
	2 AC	Coach	85	0	56	110,250	May	Feb. '42	Budd
	2 AC	Coach-Grill	85	0	48	113,070	May	Feb. '42	Budd
	2 AC	Diner-Lounge	85	0	50	115,260	May	Feb. '42	Budd
Nashville, Chattanooga & St. Louis	1	Coach	85	0	56	108,240	November	Nov. '42	Budd
New York Central	45 AC*	Coach	82	..	56	121,200	Dec. '40	August	Pullman-Standard
	25 AC*	Coach	82	2½	56	126,400	Dec. '40	Jan. '42	Amer. Car & Fdy.
	25 AC*	Coach	82	2½	56	125,000	Dec. '40	Jan. '42	Press Steel Car
	2	Mail-Bag.	85	0	..	109,550	January	November	Budd
	2 AC	Tav.-L.-Bag.	85	0	49	115,570	January	November	Budd
	6 AC	Parlor	85	0	35	112,240	January	November	Budd
	4 AC	Diner	85	0	44	124,200	January	November	Budd
	16 AC	Coach	85	0	56	114,140	January	November	Budd
	2	Obs.-Buffet	85	0	53	118,140	January	November	Budd

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Norfolk & Western	15	Coach	85	10	60	117,600	March	October	Pullman-Standard
Pennsylvania	3 AC*	Coach	85	0	60	118,400	Nov. '40	June	Pullman-Standard
	1	Coach	85	0	92	149,000	March	July	Company Shops
	2 AC	Coach	85	0	88	115,000	June	.....	Company Shops
	12 AC	Coach	85	0	60	112,835	June	Feb. '42	Budd
Pullman Company	131	Sleeping	..	..	..	.....	April	.....	Pullman-Standard
	44	Sleeping	..	..	..	.....	May	.....	Pullman-Standard
	3	Sleeping	..	..	..	.....	July	.....	Pullman-Standard
Southern	25	Bag.-Exp.	70	9	..	115,000	July	Jan.-Mar. '42	St. Lous Car
Union Pacific	30 AC	Chair	84	9	48	135,388	March	Feb. '42	Pullman-Standard
	30	Baggage	84	6	..	135,902	March	Dec.-Jan. '42	Pullman-Standard
	10	Bag.-Mail	84	6	..	138,902	March	December	Pullman-Standard
United States War Dept.—Engineering Corps.	5	Coach	..	..	..	77,000	July	Dec.-Jan. '42	Edwards
	1*	Hospital	..	..	..	.....	Dec. '40	April	Haffner-Thrall
	3*	Hospital Orderly	..	..	..	.....	Dec. '40	April	Haffner-Thrall
	1*	Hospital Office	..	..	..	.....	Dec. '40	April	Haffner-Thrall
	1*	Hospital Kitchen	..	..	..	.....	Dec. '40	April	Haffner-Thrall
	1*	Hospital Diner	..	..	..	.....	Dec. '40	April	Haffner-Thrall
Western Pacific	4	Chair	85	0	56	113,860	June	December	Budd

AC—Indicates cars are air-conditioned.
* 1940 totals have been adjusted to include these cars which were not reported last year.

Export

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Mozambique (Port. E. Africa)	19	Coach	..	..	..	.....	March	.....	Pullman-Standard

Canada

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Canadian National	7	Mail	77	3½	..	.....	March	December	National Steel
	15	Baggage	77	3½	..	.....	August	1942	National Steel
	25	Coach	74	0	64	.....	June	.....	Can. Car & Fdy.
Canadian Pacific	25	Coach	82	10⅛	72	122,200	April	1942	Company Shops

Rail-Motor Cars

For Service in the United States

Road	No.	Type of Power Plant	Horse-Power	Seating Capacity	Length of Bagg. Compt. Ft.	Length of Bagg. Compt. In.	Weight	Builder
Denver & Rio Grande Western	2 AC*	Diesel-Elec.	384	..	..	..	129,820	Budd-Her.-G.-E.
	2 AC*	Diesel-Elec.	384	..	..	..	133,810	Budd-Her.-G.-E.
Missouri Pacific	1 AC	Oil-Hydraulic	450	34	21	0	106,000	a.c.f.-Waukesha

AC—Indicates cars are air-conditioned.
* 1940 totals have been adjusted to include these cars which were ordered last year.

Locomotive Orders in 1941 Largest Since 1923

(*Continued from page 115*)

National Railways of Mexico including 20 standard-gage 4-8-4s, seven narrow-gage 2-6-6-2s and six narrow-gage 2-8-0s.

Orders placed in Canada during the year totaled 79 steam locomotives including 74 for local service and five for export. Of these, the Canadian National purchased 35 and the Canadian Pacific 37.

A comparison of 1941 orders placed in the United States for domestic service and for export and in Canada with the preceding years 1929-1940 is set forth in Table IV.

Locomotives built in the United States for domestic service during the year totaled 1,047 units, of which 206 were steam, 826 (partially estimated) Diesel-electric, and 15 electric. This compares with 435 built in 1940 of which 172 were steam, 195 Diesel-electric and 68 electric. Steam locomotive deliveries during the year were divided 18 by railroad company shops and 188 by contract car builders. Locomotives built for export totaled 57, nine less than in 1940.

The following listing of locomotive orders placed during year 1941 showing purchaser, builder and descriptive data is based on information supplied by the railways and other purchasers in response to inquiries from the *Railway Age*. Data have been checked against similar lists furnished through the co-operation of the builders and further amplified by reference to weekly reports appearing in the Equipment & Supplies column of the *Railway Age*. While the information set forth is believed to be reliable, the *Railway Age* does not guarantee the statistical accuracy or completeness of the tables or totals drawn therefrom. The statistics are intended to permit comparisons of this year's business with that of preceding years and it is felt the results shown satisfy this requirement to all practical purposes.

Reports of locomotive installations and retirements made by the Car Service Division of the Association of American Railroads will not agree with *Railway Age* totals of locomotives ordered and built, inasmuch as the Car Service Division totals cover only Class I carriers, whereas *Railway Age* totals cover all carriers, industrial companies and private car lines and the United States Government.

How to Help Finance the War Without Adding to Tax Burdens:

Treat all governmental economic services—such as improved highways and waterways—as public utilities, which in fact they are. That is, assess fees for their use at a level sufficient (as far as commercially practicable) to cover all operating costs, a fair return on the investment, and *ad valorem* taxes. The people can no longer afford to give away, or almost give away, costly services which the users would be much more willing to pay for than do without.

Equipment Prices

MORE money was raised by railroads through issues of equipment trust certificates in 1941 than in any year since 1923. The I.C.C. reports issued in connection with its authorization of these issues fortunately furnish considerable detailed information about the equipment purchased by this means. Included in these details are the only official price quotations on railroad rolling stock currently made public. Since a record list of cars and locomotives was purchased through financing of this type during the year, these price quotations furnish a wide sampling of the year's price situation.

Partial List of 1941's Locomotive Prices

No.	Type	Service	Weight lb.	Tractive Force—lb. or hp.	Unit Price
16	Diesel-Elec.	Frt.	920,000	5,400 hp.	$487,780
4	Diesel-Elec.	Frt.	216,000	1,350 hp.	478,760
8	4-6-6-4	Frt.	620,000	101,120	231,750
10	2-6-6-6	Frt.	695,000	110,200	226,499
2	4-8-4	Pass.	504,000	68,300	172,937
8	4-6-4	Pass.	442,000	52,000	168,810
5	Diesel-Elec.	Pass.	337,000	2,000 hp.	175,000
1	Diesel-Elec.	Frt.	920,000	5,400 hp.	506,928
1	Diesel-Elec.	Pass.	660,000	4,000 hp.	355,000
1	Diesel-Elec.	Pass.	616,000	4,000 hp.	352,862
2	Diesel-Elec.	Sw.-Frt.	230,000	1,000 hp.	84,563
1	Diesel-Elec.	Sw.	198,000	600 hp.	60,243
2	Diesel-Elec.	Sw.	90,000	360 hp.	36,479
6	Diesel-Elec.	Sw.	96,800	360 hp.	36,271
2	Diesel-Elec.	Sw.	88,000	360 hp.	36,314
4	2-8-2	Frt.	369,500	55,600	115,434
2	Diesel-Elec.	Sw.	198,000	600 hp.	61,488
2	Diesel-Elec.	Pass.	313,000	2,000 hp.	179,090
1	Diesel-Elec. (cabless)	Pass.	.....	2,000 hp.	166,903
25	4-8-4	Frt.	398,000	59,000	140,450
20	Diesel-Elec.	Sw.	230,000	1,000 hp.	78,500
2	Diesel-Elec.	Pass.	616,000	4,000 hp.	342,782
1	Diesel-Elec.	Sw.	250,000	1,000 hp.	79,152
1	Diesel-Elec.	Sw.	230,000	1,000 hp.	79,115
1	Diesel-Elec.	Sw.	200,000	600 hp.	60,295
1	Diesel-Elec.	Sw.	200,000	660 hp.	60,090
2	4-8-4	Pass.	478,000	64,760	209,339
7	Diesel-Elec.	Sw.	88,000	380 hp.	33,995
8	4-8-4	Pass.	475,000	64,760	192,873
10	4-8-4	Mix.	385,000	57,000	163,500
40	4-8-8-2	Mix.	657,900	124,300	214,544
2	Diesel-Elec.	Sw.	250,000	1,000 hp.	79,175
4	Diesel-Elec.	Sw.	220,000	660 hp.	60,290
7	Diesel-Elec.	Sw.	198,000	600 hp.	60,747
1	Diesel-Elec.	Sw.	220,000	600 hp.	60,572
7	Diesel-Elec.	Sw.	140,000	400 hp.	43,576
15	4-8-2	Frt.	398,000	74,100	169,000
15	4-8-8-4	Frt.	.....	135,375	267,500
15	2-8-4	Frt.	423,500	64,100	142,237
20	4-6-6-4	Frt.	.....	.....	257,006
10	Diesel-Elec.	Sw.	200,000	660 hp.	60,006
6	Diesel-Elec.	Sw.	88,000	380 hp.	36,700
5	Diesel-Elec.	Sw.	88,000	380 hp.	36,200
8	4-8-4	Mix.	492,300	69,800	188,147
6	4-6-6-4	Frt.	640,000	.....	240,613
2	Diesel-Elec.	Sw.	200,000	660 hp.	60,500
3	Diesel-Elec.	Sw.	250,000	1,000 hp.	78,796
3	Diesel-Elec.	Sw.	250,000	1,000 hp.	79,500
2	Diesel-Elec.	Sw.	240,000	1,000 hp.	78,713
2	Diesel-Elec.	Sw.	230,000	1,000 hp.	78,693
3	Diesel-Elec.	Frt.	920,000	5,400 hp.	497,360
5	Electric	Pass.			275,000
12	2-8-4	Frt.	442,500	69,350	137,978
2	Diesel-Elec.	Sw.	200,000	660 hp.	60,000
3	Diesel-Elec.	Sw.	240,000	1,000 hp.	78,950
3	Diesel-Elec.	Sw.	230,000	1,000 hp.	78,850
2	Diesel-Elec.	Sw.	250,000	1,000 hp.	79,214
*2	Diesel-Elec.	Pass.	300,000	2,000 hp.	179,605
3	Diesel-Elec.	Frt.	856,000	5,400 hp.	482,582

* Builder unable to make delivery; order cancelled or postponed.

Equipment information set forth in the accompanying tables has been lifted from these I.C.C. authorization reports. Inasmuch as the latter do not conform to any principles of completeness—giving in some cases only the number of units and total purchase price of the group—it has been necessary to fill in the gaps whenever possible from other available sources.

In view of their sources, the prices can in no sense be considered as true indices of equipment price levels or trends. Large as it is, the total equipment financed through equipment trust certificates is yet but a part of the total year's purchases financed by direct cash outlay, conditional sale contracts or other credit machinery. The I.C.C. reports list, for example, some 208 steam locomotives, whereas 288 are known to have been purchased during the year; still greater disparity arises in the case of Diesel-electrics, only 148 of which, out of a total of 686 ordered, were financed by trust issues. Furthermore, no price information is available concerning the large number of freight cars purchased by the private car lines which are not required to report their financing to the Commission.

Due to the necessity of getting as much car-floor area in service on the railroads as quickly as possible and to stringencies in available space and material used by the builders, freight cars tended to be a great deal more standardized in 1941 than in the last ten years. There appear to have been fewer experiments in special types and special materials and more instances of large lots of standard cars alike as peas in a pod. Therefore, there is not so great a disparity between the prices of various cars as has been experienced in previous years and the prices given may be taken as quite typical. However, a good many special devices have gone into rather common application in recent years—such as extra doors for l.c.l. lading, doors for end loading and automobile handling devices—which have great weight in the price tag, yet which are not mentioned in the I.C.C. reports. Whenever it has been possible to obtain the information, the existence of such special features has been noted in the accompanying table of freight car prices.

Some of 1941's Passenger-Train Car Prices

No.	Type	Length	Seating Capacity	Weight lb.	Unit Price
3	Bagg.-Mail-Tavern	82 ft.	25	120,000	91,500
15	Coach	82 ft. 3 in.	64	113,487	65,100
1	Coach	82 ft. 3 in.	56	114,224	73,300
3	Dining	82 ft. 8 in.	35	122,386	89,000
2	Parlor	82 ft. 3 in.	35	112,848	64,100
1	Bagg.-Dining	82 ft.	36	126,073	80,500
10	M.-U. Coach	.....	52	.....	40,000
2	Tap Room	.....	..	.....	40,000
8	Coach	82 ft. 3 in.	68	113,000	38,000
2	Bagg.-Coach	82 ft. 3 in.	40	112,000	38,000
2	Dining	.....	..	.....	50,000
6	Parlor	.....	..	.....	40,000
7	Bagg.-Exp.	70 ft. 8½ in.	..	131,600	28,053
1	Bagg.-Dorm.-Coach	.....	22	.....	71,600
1	Dining	.....	..	.....	79,800
1	Tavern-Lounge-Obs.	.....	..	.....	80,900
3	Coach	.....	56	.....	66,600
1	Mail (Stor.)	73 ft. 2 in.	..	.....	52,775
2	Bagg.-Exp.	73 ft. 2 in.	..	.....	52,775
2	Bagg.-Mail	72 ft. 2 in.	..	.....	58,474
2	Coach	85 ft.	56	.....	74,373
2	Grill-Dorm.-Coach	85 ft.	48	.....	78,097
2	Dining-Lounge	85 ft.	42	.....	88,377
1	Rail Motor	.....	34	.....	96,378
25	Bagg.-Exp.	70 ft. 9 in.	..	115,000	23,000
30	Chair	84 ft. 9 in.	48	135,388	70,432
30	Baggage	84 ft. 6 in.	..	135,902	47,595
10	Bagg.-Mail	84 ft. 6 in.	..	138,902	55,778
4	Chair	85 ft.	56	116,750	68,670
1	Lunch-Dining	83 ft. 2 in.	38	117,000	90,200
10	Dining	83 ft.	36	108,000	87,570
6	Club-Lounge	79 ft. 6 in.	28	102,000	80,380
16	Chair	83 ft. 10 in.	52	101,000	70,490
5	Bagg.-Mail	93 ft. 8 in.	..	85,000	60,720
21	Baggage	73 ft. 2 in.	..	85,000	58,590
20	Coach	71 ft. 11 in.	80	.....	44,777
95	Coach	82 ft.	56	125,000	48,730

The omission in the I.C.C. reports of details of construction and accessories remains an important consideration in analyzing the price of passenger equipment. There were, it is true, fewer "named" trains purchased during the year and standard passenger coaches make up a considerable portion of the list. But today's "standard passenger coach" is a highly-bred animal and wide variations as to expense of various installations obtain. Unless the reader finds it possible to identify specific rolling stock items listed, the accompanying unadorned price quotations are of but limited significance.

Unlike previous years the I.C.C., reports have listed virtually all of the passenger units individually so that the accompanying list of passenger train car prices gives

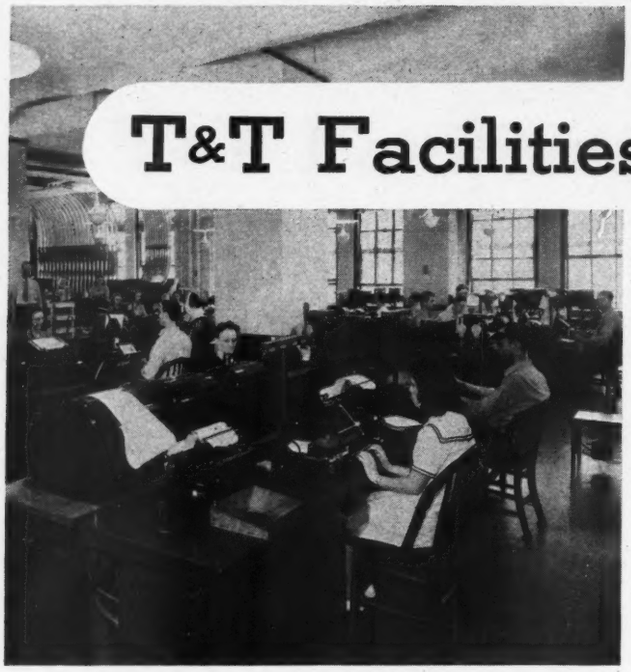
a more complete picture of unit prices than has been possible in previous years. The table omits, however, two complete trains of 16 cars each which are of the highest order of design, decoration and appointment. This equipment comprises 16 passenger coaches, 6 parlor cars, 4 dining cars, 2 observation-buffet cars, 2 tavern-lounge-baggage cars and 2 mail and mail storage cars. A total purchase price of $2,175,000 is quoted for the two train sets.

To the list of locomotive prices there should be added a total of $1,504,372 quoted for ten 2-8-4 type freight locomotives.

Some of 1941's Freight Car Prices

No.	Type	Construction	Capacity lb.	Unit Price
1,000	Box	Steel	100,000	3,071
1,000	Hopper	Steel	100,000	2,383
500	Box (L. W.)	Steel-Sheath	100,000	3,215
750	Gondola	Steel	100,000	2,385
250	Gondola	Steel	100,000	2,360
200	Ore	Steel	140,000	2,565
1,000	Box	Steel	100,000	3,100
2,000	Box	Steel	100,000	2,800
500	Box	Steel	100,000	3,150
175	Auto-Box (L. D.)	Steel	100,000	3,800
50	Covered Hopper	Steel	140,000	3,000
250	Hopper	Steel	110,000	2,100
100	Gondola	Steel	140,000	2,800
400	Flat	Steel	100,000	2,175
200	Stock	Steel-Frame	80,000	2,200
250	Ballast	Steel	140,000	3,734
500	Box	Steel-Sheath	100,000	3,000
25	Caboose	Wood-Lined	.....	3,500
1,000	Box	Steel	100,000	2,750
500	Auto-Box	Steel	100,000	2,850
500	Hopper	Steel	100,000	2,450
25	Caboose	Steel-Sheath	.....	3,550
700	Box	Steel-Sheath	100,000	2,991
500	Box	Steel-Sheath	100,000	3,243
500	Box	Steel	100,000	3,396
500	Box	Steel	100,000	3,385
300	Gondola	Steel	100,000	2,964
250	Hopper	Steel	140,000	4,017
350	Gondola	Steel	100,000	2,709
150	Gondola	Steel	100,000	2,712
300	Box	Wood-Lined	100,000	3,353
200	Box	Wood-Lined	100,000	3,355
800	Box	Steel-Sheath	100,000	2,953
100	Auto-Box	Steel-Sheath	100,000	3,284
100	Furniture	Steel-Sheath	100,000	3,797
50	Flat	Steel	140,000	3,293
250	Gondola	Steel	140,000	3,189
50	Covered Hopper	Steel	140 000	3,604
250	Hopper	Steel	100,000	2,314
5	Flat	Steel	180,000	6,612
30	Gondola	Steel	100,000	2,775
30	Twin Hopper	Steel	100,000	2,355
200	Auto-Box	Steel	80,000	3,662
100	Auto-Box	Steel	80,000	3,448
200	Gondola	Steel	140,000	3,120
100	Flat	Steel	140,000	3,337
800	Box	Steel	80 000	2,860
150	Hopper	Steel	100,000	2,450
50	Auto-Box (L. D.)	Steel	80,000	3,950
500	Box	Steel-Sheath	80,000	3,376
500	Box	Steel-Sheath	80,000	3,383
1,000	Hopper	Steel	100,000	2,669
200	Refrigerator	Steel-Sheath	80,000	4,928
100	Covered Hopper	Steel	140,000	3,795
100	Flat	Steel-Frame	100,000	2,847
200	Box	Steel	100,000	2,755
50	Box	Steel	100 000	3,104
1,000	Hopper	Steel	100,000	2,344
1,000	Box	Steel-Sheath	100,000	2,828
100	Box	Steel	100,000	3,520
1,200	Hopper	Steel	110,000	2,472
70	Cement (Cov. Hop.)	Steel	140,000	3,743
2	Flat (Depressed)	Steel	250,000	15,376
40	Auto Parts	Steel	100,000	6,067
35	Auto Parts	Steel	100,000	5,604
25	Auto Parts	Steel	100,000	4,069
50	Cement (Cov. Hop.)	Steel	140,000	3,655
800	Box	Steel-Sheath	100,000	3,015
200	Auto-Box	Steel	100,000	3,992
500	Hopper	Steel	140,000	3,326
300	Hopper	Steel	100,000	2,262
400	Box	Steel-Sheath	80,000	2,982
200	Hopper	Steel	100,000	2,357
300	Gondola	Steel	100,000	2,598
200	Flat	Steel	140,000	2,724
600	Flat	Steel	110,000	2,949
145	Auto-Box	Steel	110,000	3,678
100	Box (E. D.)	Steel	110,000	3,328
3,000	Box	Steel	110,000	2,650
500	Box	Steel	110,000	2,954
500	Box	Steel	110,000	3,071
1,000	Gondola (H. S.)	Steel	140,000	2,520
500	Box	Steel	100,000	2,786
250	Hopper	Steel	100,000	2,360
900	Box	Steel	100,000	3,062
250	Gondola (L. S.)	Steel	100,000	2,867
100	Auto-Box	Steel	100 000	3,933
1,000	Box	Steel	100,000	2,798
250	Box	Steel-Sheath	80,000	2,809
50	Gondola	Steel	100,000	2,616
50	Hopper	Steel	100,000	2,241
1,850	Box	Steel-Sheath	100,000	3,110
200	Ballast	Steel	140,000	3,517
1,000	Box	Steel	100,000	3,100
1,000	Box	Steel	100,000	2,650
500	Gondola	Steel	140,000	3,100
2,000	Gondola	Steel	140 000	2,700
200	Caboose	Steel	.....	4,200
100	Box	Steel	100,000	2,817
100	Box	Steel	100,000	2,821
100	Box	Steel	100,000	2,851
100	Auto-Furn.	Steel	80,000	3,185
75	Auto-Box (E. D.)	Steel	100,000	4,133
25	Auto-Box	Steel	100,000	3,921
40	Caboose	Steel	.....	4,776
25	Covered Hopper	Steel	140,000	3,662
500	Box	Wood-Lined	100,000	2,840
200	Hopper	Steel	140,000	2,886
500	Box	Wood-Lined	100,000	3,072
100	Flat	Steel-Frame	100,000	2,670
100	Hopper	Steel	140,000	3,098
50	Cement (Cov. Hop.)	Steel	140,000	3,788
3,000	Box	Steel-Sheath	100,000	2,775
300	Box	Steel-Sheath	100,000	3,250
50	Box (E. D.)	Steel-Sheath	100,000	3,650
50	Auto-Box	Steel-Sheath	100,000	4,450
500	Flat	Steel	140,000	3,075
100	Gondola	Steel	140,000	3,400
500	Box	Steel-Sheath	100,000	2,883
500	Box	Steel-Sheath	100,000	2,890
500	Box	Steel-Sheath	100,000	2,896
500	Box	Steel-Sheath	100,000	2,889
500	Box	Steel-Sheath	100,000	3,575
50	Gondola	Steel-Frame	140,000	4,395
1,000	Ballast	Steel	100,000	3,050
2,000	Box (L. W.)	Wood-Lined	100,000	3,287
250	Auto-Box (L. W.)	Wood-Lined	100,000	4,446
300	Flat	Steel	100,000	2,770
50	Gondola	Steel	140,000	3,555
2,000	Box	Wood-Lined	100,000	3,400
100	Caboose	Steel	.....	5,238
200	Box	Steel	100,000	3,503
300	Twin Hopper	Steel	100,000	2,590
200	Gondola	Steel	100,000	3,191
25	Flat	Steel	100,000	3,529
350	Box	Steel-Sheath	100,000	2,986
300	Flat	Steel-Frame	100,000	2,589
500	Hopper	Steel	120,000	2,233
3,000	Box	Steel	100,000	3,050
500	Auto-Box	Steel	100,000	3,720
200	Gondola	Steel	100,000	2,840
200	Tank	Steel	140,000	3,670
75	Covered Hopper	Steel	140,000	3,930
1,600	Box	Wood-Lined	100,000	2,947
700	Auto-Box	Wood-Lined	100,000	3,136
300	Furn.-Auto	Wood-Lined	100,000	3,453
200	Gondola (H. S.)	Steel	100,000	2,348
100	Phosphate	Steel	140,000	3,469
5	Covered Hopper	Steel	140,000	4,154
7	Caboose	Steel	.....	6,075
150	Box	Steel	100,000	3,818
50	Box (E. D.)	Steel	100,000	4,157
50	Auto-Box	Steel	100,000	4,582
150	Hopper	Steel	140,000	3,905
1,000	Hopper	Steel	100,000	2,674
1,000	Gondola	Steel	140,000	3,131
250	Box	Steel	100,000	2,818
250	Box	Steel	100,000	2,826
250	Box	Steel	100,000	2,864
250	Box	Steel	100,000	2,872
400	Hopper	Steel	100,000	2,215
300	Hopper	Steel	100,000	2,280
300	Hopper	Steel	100,000	2,278
50	Flat	Steel	100,000	2,708
25	Flat	Steel	140,000	3,641
10	Flat	Steel	250,000	10,331
6	Flat	Steel	250,000	11,352
4	Flat	Steel	250,000	12,292

L. W.—Light-weight.
L. D.—Equipped with loader device.
E. D.—Equipped with end doors.
L. S. and H. S.—Low- and high-side.



T&T Facilities Increased in '41

New demands for communication being met by utilizing existing line wires to handle more telegraph printer and long-distance telephone service

By John H. Dunn
Associate Editor

Telegraph Message Traffic Has Been Facilitated By the Installation of Printers

IN order to meet the increasing demands for communication, the railroads expanded and increased the capacities of their telegraph and telephone facilities during 1941 at a rate somewhat in excess of that for previous years.

As a step in the national program for utilizing freight cars most efficiently, cars must now be spotted when needed for loading, but not before, and, likewise, advance information concerning the exact time when loaded cars will be ready for movement must now be handled by wire communication. Shippers and consignees are also demanding detailed information regarding the progress being made by cars in transit and the volume of raw materials and finished war equipment, as well as the movement of military forces, have created an additional communication load. Furthermore, increased passenger traffic has required additional communication concerning tickets and reservations. Added to all this is the necessity for utilizing railroad facilities as a whole more intensively than ever before. In brief, during 1941 the railroads made excellent progress in meeting these demands by installing facilities to provide additional communication.

Increased Telegraph Service

The problems that have arisen with reference to telegraph message traffic have consisted not only in increasing the speed of operation but also in providing capacity adequate to enable peak loads to be handled promptly, thus avoiding congestion and insuring the return of answering messages promptly, especially near the close of a business day. For these reasons, Morse code telegraph is rapidly being replaced with telegraph printers for service between important offices, terminals and yards. In 1941, a total of 12,220 miles of telegraph printer circuits were placed in service, and 196 printer machines were installed, this being a slight decrease in miles of circuits but an increase of 33 machines as compared with 1940. The C. B. & Q. converted 2,549 miles of Morse telegraph circuits to printer operation. The Union Pacific installed 1,229 miles of printer circuits; the Canadian National 1,033 miles; the Pennsylvania, 1,531, and the Atchison, Topeka & Santa Fe, 925 miles. The Chicago, Burlington & Quincy installed 56 printer machines; the Atchison, Topeka & Santa Fe, 41; the Canadian Pacific, 41 and the Pennsylvania, 29.

While trains are en route, the consists are being transmitted more generally by page printers so that yardmasters and others involved can check them for diversion orders, and plan the switching before the trains arrive, thereby saving at least 20 minutes, a period which represents the difference between 50 m. p. h. and 60 m. p. h. average train speeds for a 100-mile run.

With the increased tempo of railroad operations, circumstances arise more frequently that require men at widely-spaced points to discuss certain matters in detail, in order to reach decisions within the course of a few minutes. For these requirements, long-distance telephone service is much more satisfactory than an exchange of telegrams. For this reason the railroads installed a total of 9,559 miles of long-distance telephone circuits in 1941, including 2,370 miles on the Canadian Pacific; 1,504 miles on the Southern Pacific; 1,211 miles on the Atchison, Topeka & Santa Fe and 1,050 miles on the Southern.

Principal Printing Telegraph Installations Completed in the United States and Canada During 1941

	Miles of Circuit	Number of Machines
Atchison, Topeka & Santa Fe	925	41
Boston & Maine	187	..
Canadian National	1,033	5
Canadian Pacific	3,471	41
Chicago, Burlington & Quincy	2,549	56
Chicago, Milwaukee, St. Paul & Pacific	41	4
Chicago, Rock Island & Pacific	618	2
Erie	89	3
New York, New Haven & Hartford	104	3
Pacific Electric	12	2
Pennsylvania	1,532	29
Texas & New Orleans	427	2
Union Pacific	1,230	8

Pole Line and Line Wire Construction

During 1941, new pole lines or reconstruction so extensive as to be practically equivalent to new construc-

tion was carried to completion on 2,775 miles of railroad-owned line; on 3,069 miles owned by commercial companies; and on 1,356 miles owned jointly by the railroads and commercial companies. About 8,539 miles of new line wire for either new circuits or replacements was installed by the railroads, and 4,849 miles was installed jointly by the railroads and commercial companies. Practically all of this line wire is copper. A special item of interest is the fact that during 1941 the Boston & Maine installed copper-bearing steel line wire on a limited mileage.

Means of Obtaining Additional Communication Over Existing Wires

On account of the expense involved for installing additional wires, as well as the present necessity for conserving metals as a part of the National Defense Program, additional communication circuits were obtained in 1941 for the most part by utilizing existing line wires for more than one purpose. Between Richmond, Va., and Clifton Forge, the Chesapeake & Ohio provided a long-distance telephone circuit by stringing one wire between Richmond and Gladstone, 119 miles, and pairing it with an existing telegraph wire, then grouping this circuit with another telephone circuit to form a phantom group, and also using an existing phantom group on the remaining 111 miles between Gladstone and Clifton Forge. The Chicago & Eastern Illinois secured a telephone circuit on 163 miles by installing a phantom circuit on existing telegraph message and dispatchers' telephone circuits. The Erie obtained 87 miles of printer circuit by duplexing, and the Pennsylvania used a composited circuit for printer operation on 285 miles. The Southern obtained 455 miles of long-distance telephone circuits by stringing one wire for 63 miles; stringing one wire and transposing with an existing telegraph wire for 42 miles; and by compositing existing wires for 140 miles.

In addition to such methods as the duplex and phantom which have been known for years, several railroads also installed the modern carrier scheme. In the carrier system, messages are transmitted by high-frequencies which are super-imposed on existing wires in a manner which does not interfere with the form of transmission already in service. With the single-channel carrier system, for example, frequencies between 4 and 11 kilocycles can be used to handle a telephone circuit on existing wires, or with the three-channel system, frequencies between 6 and 30 kilocycles can be used to transmit three telephone conversations simultaneously in addition to an open-wire voice-frequency telephone circuit formerly in service on the same pair of line wires. During 1941, the Southern Pacific obtained 1,504 miles of circuits by the use of carrier; the Southern, 516 miles; the Norfolk & Western, 501 miles, the Louisville & Nashville, 187 miles; the Gulf, Mobile & Ohio, 291 miles; the St. Louis-San Francisco, 478 miles; the Canadian Pacific, 2,030 miles, and the Canadian National, 870 miles, while Atchison, Topeka & Santa Fe carrier system installations totaled 5,194 miles.

During 1941, Morse telegraph for train dispatching was replaced by telephone service on 1,296 miles, as compared with only 519 miles the previous year. The A. T. & S. F. installed telephone train dispatching on 308 miles; the D. & R. G. W. on 170 miles; the Louisiana & Arkansas on 312 miles; the Southern on 138 miles and the Pennsylvania on 132 miles.

Looking to the future, facsimile equipment may offer advantages for certain types of railroad communication.

Principal Increases in Communication Plant Facilities in the United States and Canada During 1941, as Compared With 1940

	1941	1940
Miles of new or rebuilt pole line:		
Railroad owned	2,742	2,440
Commercially owned	3,069	3,319
Jointly owned	1,357	1,713
Total	7,168	7,472
Miles of new copper wire:		
Railroad owned	8,504	4,233
Commercially owned	4,849	1,832
Total	13,353	6,065
Gross increase in miles of road dispatched by telephone	1,296	519
Increase in miles of long distance telephone circuits	9,607	8,797
New mileage of telegraph circuits, all types	5.221	3,965
Increase in miles of printing telegraph circuits	12,217	15,108
Number of new printing telegraph machines	196	163
Increase in miles of new carrier-current systems	9,695	9,824

New Mileage of Telephone Train Dispatching and Long-Distance Telephone Circuits Placed in Service During 1941

	New Miles of Road Dispatched by Telephone	Miles of New Long-Distance Telephone Circuits
Atchison, Topeka & Santa Fe	308	1,211
Atlantic Coast Line	...	57
Canadian Pacific	35	2,370
Central of Georgia	...	144
Chesapeake & Ohio	20	232
Chicago & Eastern Illinois	...	163
Chicago, Burlington & Quincy	...	701
Chicago, Rock Island & Pacific	132	151
Delaware, Lackawanna & Western	...	79
Denver & Rio Grande Western	171	171
Louisiana & Arkansas	312	...
Missouri Pacific	21	...
Missouri-Kansas-Texas	...	40
New York Central		
Cleveland, Cincinnati, Chicago & St. Louis	...	32
Norfolk & Western	...	167
Pacific Electric	...	3
Pennsylvania	132	571
St. Louis-San Francisco	...	478
Seaboard Air Line	...	255
Southern	138	970
New Orleans & Northeastern	...	85
Southern Pacific	12	1,504
Texas & New Orleans	16	215
Union Pacific	...	9

Principal New and Rebuilt Pole Line Construction and New Line Wire Installed in the United States and Canada During 1941

	New or Rebuilt Pole Lines			Miles of New Copper Wire	
	Miles of Railroad Owned	Commercially Owned	Jointly Owned	Railroad Owned	Commercially Owned
A. T. & S. F.	81	...	367	2,272	302
A. & St. A. B.	...	51	...	...	...
A. C. L.	115	51	...	...	62
B. & O.	...	...	...	82	...
B. & L. E.	3	...	...	209	...
B. & M.	...	44	...	...	11
C. N.	...	...	367	466	1,551
C. P.	51	...	...	1,048	1,260
C. & O.	219	84	21	128	...
C. & E. I.	...	...	50	...	...
C. B. & Q.	500	134	177	...	...
C. M. St. P. & P.	236	...	...	382	75
C. R. I. & P.	96	87	72	284	18
C. St. P. M. & O.	...	132	...	...	12
D. & R. G. W.	...	...	...	76	...
Erie	34	45	1	86	6
G. N.	157	...	...	601	69
L. & A.	...	...	...	624	...
L. & N.	513	...	...	179	...
M. P.	...	115	...	276	...
N. C. & St. L.	201	...	...	...	...
N. Y. C. & St. L.	...	...	141	...	...
N. Y. N. H. & H.	...	181	...	265	37
Penna.	257	...	...	151	...
S. A. L.	...	56	...	...	255
Sou.	...	...	...	...	210
S. P.	...	705	...	790	625
U. P.	...	...	...	303	82
W. P.	...	...	153	31	...

For example, the Pennsylvania has ordered equipment and planned two types of such projects. Two-way operation between machines in the general office at Philadelphia, Pa., and at the shops in Altoona, Pa., will be used not only for regular messages but also for the reproduction of small sketches and drawings. Also, on a certain branch line, train orders will be produced in type on regular forms at outlying unattended offices where they will be picked up by train crews.

Yard and Train Communication

In addition to the practice of using printers to transmit train consists while trains are en route so that diversions and switching can be planned before the arrival of the trains, other forms of communication for expediting yard operations have been improved and installed during 1941. In some flat switching yards, loud speakers were installed at various locations along the main lead and at other strategic places throughout the yard, with transmitters in the yardmaster's office, at a station along the main lead and at other points. With this equipment, yardmasters, conductors and other authorized men can give instructions to switchmen and trainmen, as well as to enginemen under certain circumstances. Switching operations, especially during night hours and bad weather, are thereby expedited, and accidents are prevented.

In some hump classification yards telephone equipment is provided to enable the humpmaster to talk to the engineman of the locomotive that pushes the cars up to the hump. By this means, and regardless of conditions which might obscure signals, the operations can be conducted smoothly at the most efficient rate without losing time for starting and stopping. In some installations, such as that on the Louisville & Nashville at DeCoursey, Ky., a signal is provided in the locomotive cab so that the engineman is informed not only that the system is in operation and that the last instruction is still in effect, but also to insure that he receives a warning when a new instruction is to be given. On an installation now under way in a yard at Roanoke, Va., the Norfolk & Western is providing two-way conversation between the humpmaster and the engineman.

During 1941, the Bessemer & Lake Erie continued tests of its train communication system in which two-way telephone conversation is provided between a conductor in the caboose of a freight train and the engineman in the cab of the locomotive. This equipment is now in service on two locomotives and two cabooses. The system also provides the possibility for conversation between a wayside office and employees in the locomotives as well as the cabooses. On many of the new high-speed through passenger trains on various roads, telephone systems have been provided primarily for the use of passengers, not only to converse with each other when in different cars, but also to call the dining or club cars, etc. In addition, the system is available for communication between members of the engine and train crews. In all these many varied forms, it is evident, therefore, that the railroads have been active in the improvement and expansion of their communication facilities during the last year.

THE LARGEST PHOTO-MURAL IN THE WORLD has been placed in Grand Central terminal, New York. Covering the entire east wall of the main concourse, where approx. 200,000 persons will view it daily, the 96-ft. by 118-ft. mural was erected by the United States Treasury department as a part of its campaign to sell defense bonds. Enlargements selected from 20,000 prints are mounted on composition board on a steel scaffolding. The views show typical American life.

Investors' Interest Still Lacking

(*Continued from page 76*)

creased earnings, has seemed unjust to many equity-holders, who have in some instances secured court favor in their resistance to being thus "frozen out." An additional factor aiding such resistance has been the basis of taxation of reorganized companies decreed by the Internal Revenue Bureau—which in some cases, appears to leave even favored bondholders in reorganized companies less-well-off than they would be if the equity-holders were given contingent participation.

Status of I. C. C. Reorganization Cases

The status of reorganization proceedings (trusteeships but not receiverships) of the more important companies may be tabulated as follows:

Cases pending in the federal district courts, no plans having been submitted by the parties for action by the I. C. C. and no plans having been prepared by the I. C. C.:

Central of Georgia
Central of New Jersey
Chicago, Indianapolis & Louisville
Duluth, South Shore & Atlantic
New York, Ontario & Western

Cases in which the I. C. C. has issued proposed reports, but not final reports:

Florida East Coast
Minneapolis, St. Paul & Sault Ste. Marie
New York, Susquehanna & Western

Cases in which a final plan has been approved by the I. C. C. and sent to the district court:

Alabama, Tennessee & Northern
Boston & Providence
Chicago, Rock Island & Pacific (court has ordered interested parties to show cause by December 31 why plan should not be disapproved and referred back to I. C. C.)
Denver & Rio Grande Western (plan referred by court back to I. C. C., which has issued a revised plan on which re-arguments have been had; a final revised plan is to be prepared by the I. C. C.)
New York, New Haven & Hartford (court has rejected I. C. C. plan, which now comes back for modification)
St. Louis-San Francisco
St. Louis Southwestern

Cases in which final plan has been approved by district court:

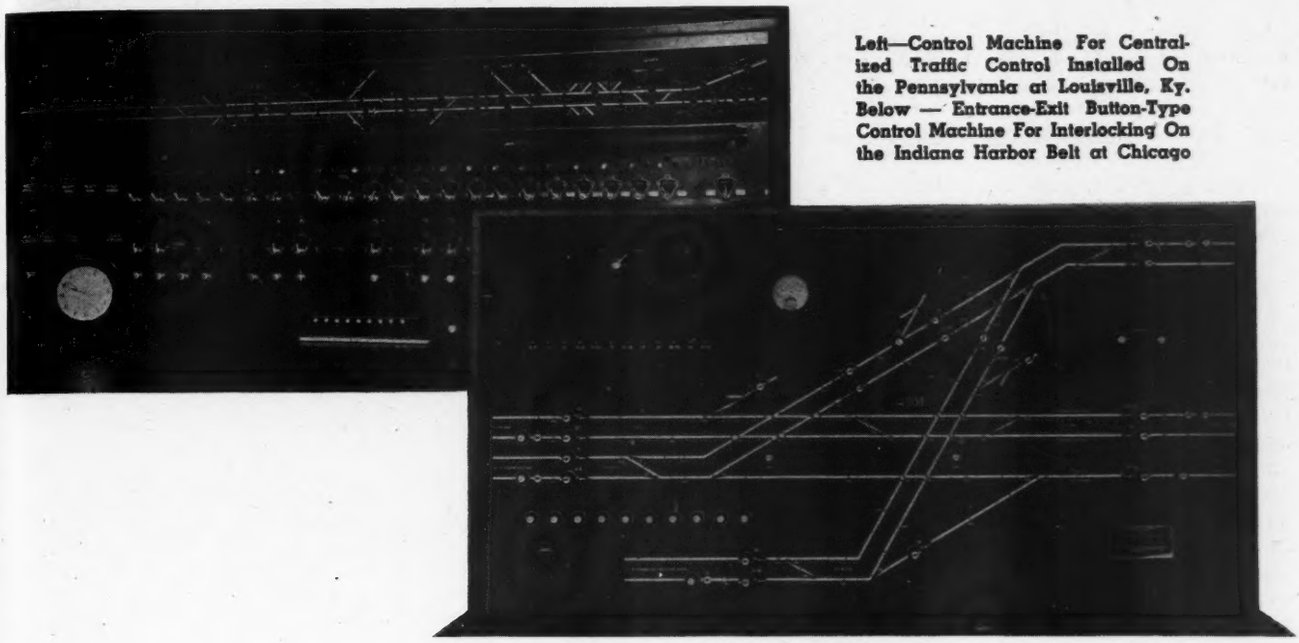
Chicago, Milwaukee, St. Paul & Pacific (circuit court of appeals has referred this case back to I. C. C. for certain findings of fact)
Missouri Pacific (creditors now voting upon the I. C. C. and court's final plan, but stockholders have instituted suit in circuit court of appeals)
Western Pacific (circuit court of appeals has disapproved I. C. C. and district court's plan; case will probably be taken to Supreme Court)
Chicago & North Western (approved by district court, plan is now before circuit court of appeals)

Cases in which a final plan has been confirmed by district court and reorganization managers have taken charge:

Akron, Canton & Youngstown
Kansas City, Kaw Valley & Western
Spokane International

Cases in which reorganizations have been finally completed and the roads have emerged from bankruptcy:

Chicago & Eastern Illinois
Chicago Great Western
Erie.



Left—Control Machine For Centralized Traffic Control Installed On the Pennsylvania at Louisville, Ky. Below — Entrance-Exit Button-Type Control Machine For Interlocking On the Indiana Harbor Belt at Chicago

Signal Construction Continued at High Level in 1941

Automatic block signals and centralized traffic control increased over 1940, while highway crossing protection, interlocking and spring switches decreased

By M. Peacock

Associate Editor

DURING 1941, the construction of signaling facilities in the United States and Canada continued at a high level, totaling 6,968 units, a decrease of 172 units as compared with 1940, but an increase of 1,951 units from 1939. With the exception of 1940, the volume of signaling placed in service during 1941 exceeded that for any year since 1931, when the total was 11,349 units, the minimum being 2,507 units in 1934.

During 1941, increases over 1940 were shown in the installation of automatic block signals, and centralized traffic control, while decreases were shown in highway crossing protective units, interlocking and spring switch mechanisms. Increases were shown in the number of facing-point locks and signals installed at spring switches.

Interlocking Decreased

Based on the number of operative signal units and switches, interlocking facilities installed in 1941 as new plants or additions to existing plants, totaled 1,211 units, a decrease of 547 units as compared with the 1,758 switch and signal units installed in 1940. Of the total of 393 interlocked switches installed in 1941, 143 were electric, 105 electro-pneumatic and 145 mechanical. During last year, 43 new plants were installed as compared with 49 in 1940. Of these, 26 were of the type using miniature levers or buttons without mechanical locking and 17 were of the type using levers with mechanical locking. The 26 interlockings were 8 less than the 34 installed in 1940, while the 17 manually-controlled interlockings were two more than the 15 built in 1940. The largest of the 17 interlockings using levers with mechanical locking installed in 1941, was on the Belt Railway of Chicago (operated by the Chicago & Western Indiana), at a crossing with the Wabash. This plant includes 19 operative signal units and 16 electric switch machines.

Miniature Lever and Button Plants

Of the 26 miniature lever and button plants, 23 were of the miniature lever type and 3 were of the button type. The New York Central installed a button-type entrance-exit control interlocking at Dunkirk, N. Y., including 40 operative signal units and 18 electric switch machines. The Indiana Harbor Belt installed a button-type entrance-exit plant in Chicago, including 29 operative signal units and 18 electric switch machines. At Hillyard, Wash., the Great Northern installed a miniature lever plant, including 21 operative signal units and 6 electric switch machines. The Wheeling & Lake Erie installed

a miniature lever plant at Toledo, Ohio, including 13 operative signal units and 3 electric switch machines.

Rebuilt Interlocking Plants

During 1941, a total of 56 interlockings were rebuilt, an increase of 21 over the record for 1940. Of these 56 interlockings, 12 were of the miniature lever type and 44 were of the type utilizing levers with mechanical interlocking. A total of 442 new operative signal units, 39 electric switch machines, 90 electro-pneumatic switch machines, and 118 mechanically-operated switches were included in the improvements. The largest interlocking rebuilt in 1941, involving levers with mechanical locking, is on the Norfolk & Western, at a crossing with the Southern at Lynchburg, Va., including 41 operative signal units and 20 electro-pneumatic switch machines. The second largest rebuilt was an interlocking by the Lehigh Valley at Lehighton, Pa., including 25 operative signal units and 21 electric switch machines.

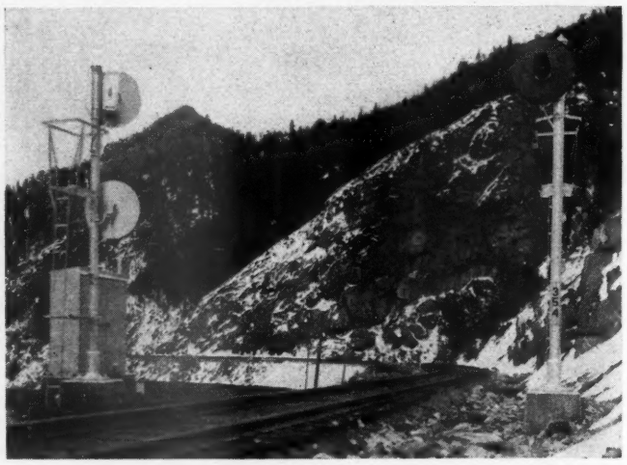
Many other interlockings, not listed in the tables, were overhauled to remove derails and detector bars, install electric track circuit locking and make other revisions, in order to comply with the requirements of the Interstate Commerce Commission and to remove the hazard of derail operations. For example, the Chicago & Eastern Illinois removed main track derails at interlockings at Tamms, Ill., St. Anne, Watseka and St. Elmo.

Comparison of Annual Signal Construction

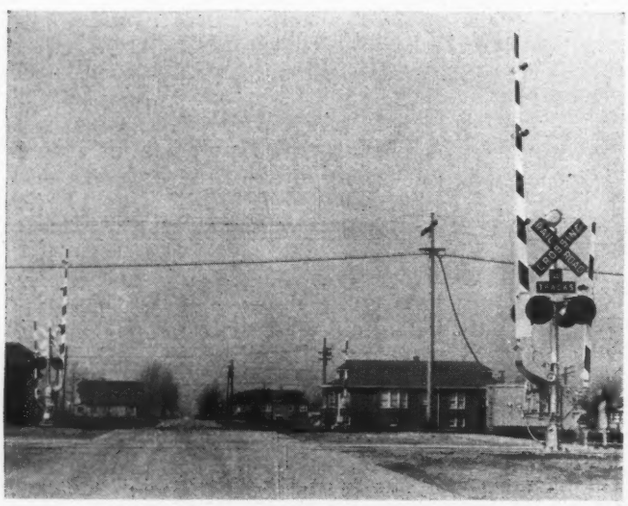
Type of Installation	Number of Units 1940	1941
AUTOMATIC BLOCK SIGNALS	1,017	1,407
HIGHWAY CROSSING PROTECTIVE UNITS	3,006	2,615
INTERLOCKINGS		
Signals and switches at new plants	1,024	518
Signals, switches and electric switch locks added at rebuilt plants	734	693
Signals and switches at automatic plants	125	80
CENTRALIZED TRAFFIC CONTROL		
Signals, switches and electric switch locks	496	868
SPRING SWITCHES		
Spring mechanisms	294	275
Mechanical facing-point locks	97	159
Signals installed at spring switches	336	353
CAR RETARDERS	11	...
	7,140	6,968

Automatic Interlockings

A total of 11 automatic interlockings were installed in 1941, including 76 signals, 2 electrically-locked gates and 2 smashboards. The majority of these replaced mechanical interlockings. For example, new automatic plants on the Canadian Pacific at Vankleek, Ont., and St. Johns, Que.; on the St. Louis-San Francisco at Baxter Springs, Kan.; and on the Chicago, Rock Island & Pacific at South Bend, Neb., replaced mechanical interlockings. At other crossings, automatic plants were installed where no interlocking was in service previously as on the Detroit, Toledo & Ironton where an automatic interlocking was installed at a crossing with the New York, Chicago & St. Louis at Morris, Ohio, near Lima, to replace a swinging gate and tilting crossbar signal.



Automatic Signals on the Denver & Salt Lake



Short-Arm Crossing Gates and Flashing-Light Signals on the Indiana Harbor Belt

C. T. C. Increased

Centralized traffic control was installed on 392.3 miles of single track, 59 miles of double track and 4.4 miles of middle track, totaling 514.7 miles of track in 1941. These installations included 292 levers to control 675 signals and 190 power switches. These figures are larger than those for 1940 when C. T. C. was installed on 195 miles of single track and 72 miles of double track, including 231 levers to control 121 power switches and 375 signals. The most extensive centralized traffic control installation in 1941 is on the Canadian National between Moncton, N. B., and Truro, N. S., involving 101.1 miles of single track and 22.9 miles of double track, including 75 power switches and 198 signals. The Pennsylvania installed C. T. C. on 60.7 miles of single track between Norwood Heights, Ohio, and Glen, utilizing 28 levers to control 9 power switches and 38 signals. The Chicago, Milwaukee, St. Paul & Pacific installed C. T. C. on 60.3

Automatic Interlockings Installed in 1941

Railroad	Location	Signals	Manufacturer
C. N.	Ste. Rosalie, Que.	11	.....
C. P.	Vankleek, Ont. (R)	5	G.R.S.
	St. Johns, Que. (R)	14	Union
C. M. St. P. & P.	Slater, Ia. (R) (S)	..	Union
C. R. I. & P.	Yukon, Okla.	4	Union
		2(4)	
	South Bend, Neb. (R)	8	Union
D. T. & I.	Morris, Ohio	8	Union
G. N.	Vancouver, B. C. (R) (S)	8	G.R.S.
		2(g)	
L. & A.	Mallin, La.	8	G.R.S.
M. P.	Pineville, La.	6	G.R.S.
St. L.-S. F.	Baxter Springs, Kan. (R)	4	Union

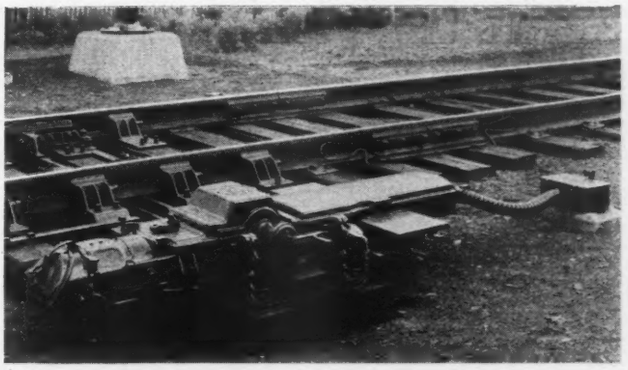
Legend:
(g) = Electrically-locked crossing gate.
(4) = Smash board.
(R) = Replaced mechanical interlocking.
(S) = Semi-automatic.

miles of single track between Manilla, Ia., and Council Bluffs, utilizing 31 levers to control 75 signals. The Seaboard installed C. T. C. on 55 miles of single track and 8 miles of double track between Richmond, Va., and Alberta, using 63 levers to control 31 power switches and 136 signals. The Erie installed C. T. C. on 29 miles of single track between Pymatuning, Pa., and Leavittsburg, Ohio, using 13 levers to control 2 power switches and 9 signals. The Denver & Rio Grande Western made a C. T. C. installation on 26.3 miles of single track between Dotsero, Colo., and Chacra, utilizing 26 levers to control 13 power switches and 38 signals. The Norfolk & Western installed C. T. C. on the Lynchburg Belt Line between Forest, Va., and Phoebe,

Interlockings Constructed in 1941, Including Also Remotely Controlled Plants

Road	Location of Type of Control Machines	No. of Signal Operating Units	No. of Switches and Derails Operated by: Electric Switch Machines	Electro Pneumatic	Mechanical Connections	Manufacturer
Manual control using levers with mechanical locking						
	NEW					
A. T. & S. F.	Plaines, Ill.	5	..	..	2	Union
C. & W. I.	Chicago, Ill.	19	16	..	..	Union
C. R. I. & P.	Medford, Okla. (S)	6	..	..	1	Union
Erie	North Tonawanda, N. Y. (R) (S)	4	..	..	2	Union
I. C.	Gibson City, Ill.	4	1	..	2	.....
	Tara, Iowa	4	1	..	2	.....
K. C. S.	Beaumont, Tex. (TL)	3	2	..	..	G.R.S.
N. Y. C.	Belt Jct., Ohio	4	1	..	..	G.R.S.
N. & W.	City Point Jct., Va.	1	..	..	2	Union
Penna.	Clayton, Del.	17	..	..	8	Union
	Gallitzin, Pa.	12	..	4	2	Union
	Colliers, W. Va.	16	..	9	..	Union
	Watson, Ind. (TL)	17	4	..	..	Union
Southern	Woodlawn Jct., Ala. (TL)	6	3	..	3	G.R.S.
T. & N. O.	El Paso, Tex.	..	..	..	1	Union
	Diball, Tex.	2	..	..	..	Union
Wabash	Baylis, Ill.	8	..	..	2	Union
		128	28	13	27	
	REBUILT					
B. & O.	Lawrenceburg, Ind.	8	..	..	5	.....
C. N.	Carberry, Man.#	2	..	..	..	G.R.S.
	Saskatoon, Sask.#	..	1†	..	..	G.R.S.
C. & O.	Covington, Va.#	3	..	..	..	Union
	Riverton, Ky.	..*	..	..	..	Union
	Carey, Ohio#	10	..	..	..	Union
C. M. St. P. & P.	Cone, Ia.	2	..	..	..	Union
	Linley, Ia.	2	..	..	..	Union
	Seymour, Ia.	1	..	..	..	Union
	Sabula, Ia.	2	..	..	..	G.R.S.
	Fond du Lac, Wis.	..	..	..	..	Union
Erie	Croton, N. J.# (R) (EP)	2	..	3	2	Union
	Columbus, Pa.	12	..	..	20	Union
G. T. W.	Port Huron, Mich.	14	..	..	10	Union
L. V.	Lehighton, Pa.	25	21	..	..	G.R.S.
	Stanley, N. Y.	6	..	..	2	.....
M. P.	Kansas City, Mo.#	1	3	..	4	G.R.S.
G. C. L. & I.— G. N.	Beaumont, Tex.	7*	..	..	..	G.R.S.
	Navasota, Tex.	..	..	..	2	G.R.S.
	Angleton, Tex.#	2	..	..	2	G.R.S.
N. Y. C.	Troy, N. Y.	10	1	..	1	.....
	Troy, N. Y.	20	1	..	7	.....
N. & W.	Petersburg, Va.#	4	..	..	..	Union
	Phoebe, Va.#	1	..	..	..	Union
	Lynchburg, Va.	41	..	20	..	Union
	Forest, Va.#	2	..	..	..	Union
	Walton, Va.#	8	1	..	..	Union
	Cowan, Va.#	1	..	..	..	Union
	Welch, W. Va.#	8	2	..	..	Union
	Iaeger, W. Va.#	5	..	..	3	Union
Penna.	Morrisville, Pa.	29	..	25	..	Union
	Metuchen, N. J.	18	..	16	..	Union
	Terre Haute, Ind. (TL)	16	..	..	..	Union
	Smithboro, Ill.	8	..	..	6	Union
L. I.	Far Rockaway, N. Y.	15	..	7	..	Union
P. M.	Bay City, Mich.	9	..	..	4	.....
	Saginaw, Mich.	15	..	..	9	.....
	Clare, Mich.	6	..	..	1	.....
	Lowell, Mich.	6	..	..	1	.....
T. & P.	Mineola, Tex.	8	..	..	5	Union
	Shreveport, La.	10	..	..	14	.....
T. H. & B.	Dunnville, Ont.	8	..	..	11	G.R.S.
Wabash	St. Louis, Mo.	13	..	..	5	Union
W. M.	Westernport, Md.	4	..	..	4	Union
		364	29 2†	71	118	
			31			
Manual control using miniature levers or push buttons with no mechanical locking but with circuit interlocking.						
	NEW					
A. T. & S. F.	Florence, Kan. (M)	6	2	..	..	Union
C. N.	St. Hyacinthe, Que. (M)	5	1	..	..	.....
	Coteau, Que. (M)	8	2	..	..	.....
C. P.	Fairville, N. B. (M)	8	1	..	..	G.R.S.
	Ballantyne, Que. (M)	5	1	..	..	G.R.S.
C. M. St. P. & P.	LaCrosse, Wis. (M)	1 2(D)	..	..	..	Union
G. N.	Hillyard, Wash. (M)	21	6	..	..	G.R.S.
I. C.	Oaks, Tenn. (M)	9	4	..	..	.....
	Leewood, Tenn. (M)	6	..	..	..	.....
L. & N.	Latonia, Ky. (B)	14	10	..	..	G.R.S.
	South Louisville, Ky. (M)	3	..	..	..	.....
	South Howell, Ind. (M)	4	..	..	..	.....
M. St. P. & S. S. M.	Slinger, Wis. (M)	5	..	..	..	.....
	Fond du Lac, Wis. (M)	6	..	..	..	.....
N. C. & St. L.	Dalton, Ga. (M)	10	..	..	..	Union
N. Y. C.	Dunkirk, N. Y. (B)	40	18	..	..	G.R.S.
I. H. B.	Chicago, Ill. (B)	29	18	..	..	G.R.S.
N. Y. C. & St. L.	Continental, Ohio (M)	6	..	..	..	Union
N. & W.	Lowry, Va. (M)	6	..	1	..	Union
	Dry Branch, Va. (M)	6	..	1	..	Union
St. L. S. W.	Tyler, Tex. (M)	4	1	..	..	Union
	Illmo, Mo. (M)	7	3	..	..	Union
Seaboard	Howells, Ga. (M)	7	2	..	..	Union
	Hamlet, N. C. (M)	5	1	..	..	Union
	Raleigh, N. C.	8	3	..	..	Union
W. & L. E.	Toledo, Ohio (M) (R)	13	3	..	..	Union
		244	76	2	..	
	REBUILT					
C. & O.	XA Cabin, Newport News, Va. (M)#	3	2†	..	..	Union
C. M. St. P. & P.	Savanna, Ill. (M)	2	..	..	..	Union
	Elm Grove, Wis. (M)	1	..	..	..	Union
D. L. & W.	Wharton, N. J. (M)	7	2	..	..	Union
N. Y. C.	Kingston, N. Y. (M) (S)	9	..	..	..	.....
N. & W.	Radford, Va. (M)#	9	1	..	..	Union
	Kermit, W. Va. (M)#	1	..	..	..	Union
Penna.	Overbrook, Pa. (M)#	18	..	14	..	Union
	Principio (M)	7	..	5	..	Union
	Columbia City, Ind. (M)	8	2	..	..	Union
Seaboard	Waldo, Fla. (M)	4	1	..	..	Union
S. P. (P. L.)	Biola Jct., Cal. (M)	9	4	..	..	Union
		78	10 2†	19	..	
			12			
		814	143 4†	105	145	
		814	147	105	145	

Legend:
TL = Table levers with mechanical locking.
# = Units added to existing installations.
* = Semaphore signals changed to light type signals.
(B) = Button Route or NX type control.
(M) = Miniature lever control.
(R) = Replaced mechanical interlocking.
(S) = Semi-automatic.
(EP) = Combined with electro-pneumatic interlocking.
(D) = Smashboard.
† = Electric switch lock.



Dual-Control Power Switch Machine in Centralized Traffic Control Territory on the Delaware & Hudson

Highway-Railroad Grade Crossing Protection Installed During 1941

Railroad	No. of Crossings	Source of Funds: Railroad	Source of Funds: Public Funds Of Any Source	Source of Funds: Joint Railroad and Public Funds	Total No. of Protective Units	No. of Wig-Wag Signals	No. of Flashing-Light Signals	No. of Rotating Disk Stop Sign Signals With Flashing Lights	No. of Traffic Type Stop-and-Go Crossing Signals	No. of Electrically Operated Gates
Alton	8	4	..	4	18	..	10	..	..	8
A. T. & S. F.	63	34	25	4	124	14	108	..	..	2
A. C. L.	36	..	36	..	110	..	59	20	..	31
B. & O.	27	15	11	1	74	..	74	..	..	..
				1†						
B. & M.	15	6	9	..	26	..	16	..	4	4
							1♯			
							1(b)♯			
C. N.	18	..	6	12	30	12	16	..	..	2(M)
C. P.	7	1	..	6	16	4	6	..	..	6
C. of G.	4	2	2	..	9	..	4	..	5	..
C. V.	6	..	6	..	20	..	18	..	..	2
C. & O.	19	8	11	..	46	..	46	..	..	..
C. & E. I.	4	4	..	..	11	..	11	..	..	..
C. & N. W.	24	1	22	1	54	..	18	32	..	4
C. B. & Q.	45	30*	15	..	146	..	86	..	..	56
							4(f)			
C. G. W.	6	..	4	2	12	..	12	..	..	..
C. I. & L.	6	5	1	..	18	..	12	..	..	6
C. M. St. P. & P.	58	8	50	..	137	8	17	78	..	34
C. N. S. & M.	3	2	1	..	6	..	2	..	..	4
C. R. I. & P.	71	12	54	5	140	..	70	..	..	70
C. St. P. M. & O.	13	..	13	..	34	..	15	19	..	..
C. S. S. & S. B.	10	3	7	..	23	..	19	..	..	4
C. & S.	1	..	1	..	2	..	2	..	..	..
D. & H.	7	7	..	..	15	..	15	..	..	..
D. L. & W.	9	9	..	..	23	..	23	..	..	..
D. & R. G. W.	27	..	27	..	56	..	56	..	..	..
E. J. & E.	6	..	6	..	16	..	12	..	..	4
Erie	11	9	2	..	38	..	34	..	..	4
G. & F.	1	..	1	..	1	..	..	..	..	1††
G. T. W.	25	4	12	9	58	..	41	..	..	12
										4♯
										1††
G. N.	11	5	6	..	22	2	20	..	..	..
G. B. & W.	2	..	2	..	4	..	..	4	..	..
G. M. & O.	1	..	1	..	2	..	2	..	..	..
I. C.	37	10	14	13	87	5	64	..	..	18
Y. & M. V.	4	2	2	..	10	..	8	..	..	2
I. U.	3	2	1	..	8	..	6	..	..	2
K. C. S.	18	3	15	..	36	1	35	..	..	..
K. & I. T.	2	2	..	..	4	..	4	..	..	..
L. & H. R.	1	1	..	..	4	..	4	..	..	..
L. V.	6	6	..	..	12	..	12	..	..	..
L. & A.	3	2	1	..	6	..	4	..	..	2
L. & N.	12	10	2	..	37	..	16	..	..	21
Me. C.	1	..	1	..	2	..	2	..	..	..
M. & St. L.	6	1	5	..	12	..	2	10	..	..
M. St. P. & S. S. M.	17	..	17	..	51	..	34	17	..	..
D. S. S. & A.	1	..	1	..	2	..	2	..	..	..
M.-K.-T.	9	2	7	..	20	..	20	..	..	..
M. P.	20	9	11	..	42	..	38	..	..	4
M. P. in Neb.	3	..	3	..	8	..	6	..	..	2
M.-I.	1	..	1	..	2	..	2	..	..	..
G. C. L. & I.-G. N.	8	8	..	..	16	..	16	..	..	..
N. C. & St. L.	9	2	7	..	34	..	20	..	..	14
N. Y. & L. B.	1	1	..	..	3	..	3	..	..	..
N. Y. C.	25	18	7	..	63	..	53	..	..	10
M. C.	12	1	7	4	27	..	25	..	..	2
C. C. C. & St. L.	16	5	11	..	38	..	28	..	..	10
P. & E.	2	..	1	1	9	..	7	..	..	2
I. H. B.	7	..	7	..	17	..	17	..	..	..
P. & L. E.	1	..	..	1	2	..	2	..	..	..
N. Y. C. & St. L.	34	22	12	..	75	..	67	..	..	8
N. Y. N. H. & H.	8	8	..	..	17	..	15	..	..	2
N. Y. O. & W.	1	1	..	..	2	..	2	..	..	..
N. & W.	15	15	..	..	30	30	..	..	..	..
P. E.	7	..	7	..	14	10	4	..	..	..
Penna.	60	46	13	1	157	..	129	..	..	28
L. I.	3	3	..	..	7	..	7	..	..	..
Penna.-Read. S. S.	5	3	2	..	12	..	10	..	..	2
P. M.	14	2	12	..	28	..	25	..	3	..
P. & N.	4	..	4	..	8	..	8	..	..	..
St. L.-S. F.	21	4	16	1(J)	48	..	46	..	..	2
St. L. S. W.	32	16	16	..	34	..	28	..	2	4
Seaboard	20	..	20	..	40	..	30	..	..	10
Southern	26	1	25	..	65	..	65	..	..	..
A. G. S.	1	1	..	..	3	..	3	..	..	..
N. O. & N. E.	1	..	1	..	2	..	2	..	..	..
S. P. (P. L.)	16	4	10	2	33	8	23	2	..	..
N. W. P.	3	3	..	..	4	..	4	..	..	..
S. I.	1	1	..	..	1	..	1	..	..	..
T. & N. O.	7	5	2	..	13	1	12	..	..	..
T. & P.	3	3	..	..	9	..	9	..	..	..
T. H. & B.	1	..	..	1	2	1	..	..	..	..
						1(b)				
U. P.	40	..	40	..	92	18	68	..	..	6
Wabash	17	..	6	11	50	..	31	..	..	19
W. M.	1	..	..	1	4	..	4	..	..	..
W. P.	5	2	3	..	11	..	9	..	..	2
W. & L. E.	5	5	..	..	11	..	9	..	..	2
	1,120	368	641	79	2,615	114	1,871	182	14	425
		30*		1†		1(b)				2(M)
				1(J)						4♯
		398				115				2††
				81						433

Legend:
† = Installation paid for by industries or individuals.
* = Installation paid for jointly with other railroads.
(J) = Installation paid for jointly with industries.
♯ = Units added to existing installations.
(b) = Bell.
(f) = Floodlight.
(M) = Mechanical gates.
†† = Barrier.

involving 20.9 miles of single track, including 27 levers to control 3 power switches and 28 signals.

Train Control and Cab Signals

During 1941, the principal activities in the automatic train control and automatic cab signaling fields consisted of the installation of equipment on steam, electric and Diesel locomotives, especially those used on new lightweight trains operated on through routes including sections of various railroads. A total of 289 new sets of locomotive equipment were furnished in 1941, as compared with 103 sets in 1940, an increase of 186. The largest number of sets was furnished to the Pennsylvania, which totaled 99.

Automatic Block Increased

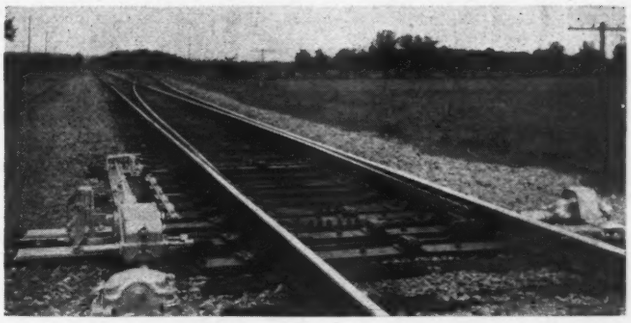
In 1941, a total of 1,407 automatic block signals were placed in service, an increase of 390 units, as compared

Intermediate Automatic Position-Light Signals in Centralized Traffic Control Territory on the Pennsylvania

with the total of 1,017 in 1940. Automatic block signaling was placed in service on 731 miles of single track, 333.2 miles of double track, 4 miles of three track and 24.5 miles of four track line, totaling 1,507.4 miles of track. This compares with 1,340 miles of track so protected in 1940. The 1941 figure of 731 miles of single-track automatic signaling shows an increase of 424.2 miles over that for 1940. In 1941, a total of 1,329 light-type signals were placed in service, as compared with 974 in 1940, an increase of 355. A total of 78 semaphore

Locomotive Train Control and Cab Signal Equipment Installed in 1941

Railroad	No. of Locomotive Equipments	Manufacturer
A. C. L. and F. E. C.	10	Union
B. & O.	4	G.R.S.
C. & O.	2	Union
C. M. St. P. & P.	4	Union
C. R. I. & P.	80	Union
I. C.	24	Union
L. & N.	16	Union
N. Y. C. & St. L.	15	Union
N. Y. N. H. & H.	15	G.R.S.
Penna.	99	Union
P. M.	12	G.R.S.
Seaboard	2	Union
Southern	6	G.R.S.
	289	



Spring Switch Equipped with a Facing-Point Lock Installed on the St. Louis Southwestern

Centralized Traffic Control Installations Completed in 1941

Railroad	Location	Miles of Road	Direct Wire or Coded Control	No. of Levers: Desk Type	No. of Levers: C.T.C. Type	Power Oper. Swths.	No. of Signals Controlled	Manufacturer
B. & M.	Baldwinville, Mass.—Royalston (t)	4.2d	DW	..	5	4	4	G.R.S.
C. N.	West End, Moncton Yard, N. B.—Pacific Jct.	8.4s 1.9d	C	..	..	3	12	G.R.S.
	Moncton, N. B.—Truro, N. S.	101.1s 22.9d	C	..	..	75	198	G.R.S.
C. & O.	Strathmore, Va.—Shores x	1.0s	DW	..	4	1♯	6	Union
	Moss Run, Va.—Alleghany	8.5d	C	..	6	6	13	Union
C. M. St. P. & P.	Manilla, Ia.—Council Bluffs	60.3s	C	31	..	2♯ ..	75	Union
D. & R. G. W.	Tunnel, Colo.—Midwest†	8.1s	C	..	8	4	12	G.R.S.
	Dotsero, Colo.—Chacra	26.3s	C	..	26	13	38	G.R.S.
Erie	Pymatuning, Pa.—Leavittsburg, Ohio	29.0s	C	..	13	2	9	Union
L. V.	Franklin Jct., Pa.—Conway†	3.1s	DW	..	5	..	6	G.R.S.
N. & W.	Poe, Va.—Jack	8.9s	C	..	12	..	11	Union
	Forest, Va.—Phoebe	20.9s	C	..	27	3	28	Union
	Walton, Va.—Bluff	3.3s	C	..	6	3	10	Union
	Welch, W. Va.—Farm	3.4d	C	..	7	4	14	Union
	Iaeger, W. Va.—Hull	4.4* 4.4d	C	..	13	10	22	Union
Penna.	Louisville, Ky.—Ore, Ind.	3.1s 5.7d	DW	..	37	23	41	Union
	Norwood Heights, Ohio—Glen	60.7s	C	..	28	9	38	Union
Seaboard	Richmond, Va.—Alberta	55.0s 8.0d	C	..	63	31	136	Union
Southern	Spartanburg, S. C.—East Spartanburg	3.1s	DW	1	..	..	2	G.R.S.
		392.3s 59.0d 4.4*	5DW 14C	32	260	190 3♯	675	
		455.7				193		

Legend:
In "Miles of Road" column: s = Single track, d = Double track, * = Middle track.
C = Coded Control.
DW = Direct-Wire Control.
† = Units added to existing installation.
(t) = In cab signal territory.
x = Installed as extension of existing interlocking.
♯ = Electric switch lock.

Automatic Interlocking Installed by the St. Louis-San Francisco at Holdenville, Okla.

signals were installed in 1941, as compared with 43 in 1940.

During 1941, rapid progress was made in the further adoption of coded track circuit control, which was used on the Louisville & Nashville, the St. Louis Southwestern, the Denver & Salt Lake and the Wabash.

Replacement of Automatic Signaling

In addition to the automatic signaling installed during 1941 on lines not previously so equipped, many roads have completed programs of signal replacements. In order to provide proper spacings for the increased braking distance required by high-speed trains, many roads have rehabilitated automatic signaling by removing certain signals and respacing the remainder. As a part of these programs, semaphore signals, in some instances, have been replaced by light signals. The Chesapeake & Ohio replaced semaphore signals with color-light signals on 6 miles of double track and 4 miles of three track lines at various locations. The Pittsburgh & Lake Erie replaced semaphore signals with color-light signals on 24.5 miles of four track line between Pittsburgh, Pa., and Monaca. Likewise, the Union Pacific replaced semaphore signals with color-light signals on 52.6 miles of double track between Lookout, Wyo., and Hanna.

Previously existing automatic signals have been rearranged on many miles of tracks not listed in the table. The Louisville & Nashville respaced and changed the controls of approximately 1,200 miles of existing automatic signals to meet higher train speeds and comply with the requirements of the Interstate Commerce Commission. A program on the Chicago, Indianapolis & Louisville, approved by the Interstate Commerce Commission, involving the removal of certain signals and the respacing of others on 382 miles of single track, is approximately half completed, at an estimated total cost of $16,000 from which the annual savings to be effected are estimated at $9,000. The Chicago & North Western respaced automatic semaphore signals on 48.2 miles of double track between Merrimac, Wis., and Elroy, and on 51.9 miles of double track between Buffalo, Wis., and Wyeville. At the same time oil semaphore lamps were replaced with electric lamps controlled by approach circuits.

A total of 275 switches were equipped with oil buffer spring mechanisms during 1941, as compared with 291 in 1940. Of the spring switches installed, 196 were at the ends of passing tracks, as compared with 236 in 1940. At the ends of double track, 38 spring switches were placed in service in 1941, as compared with 26 in 1940. At Salisbury, Mo., the Wabash equipped an end-of-double-track layout with a spring switch and facing-point lock assembly. This layout consists of an equilateral turnout with 33-ft. points. In 1941, spring mechanisms were provided on 15 junction switches, an increase of 2 as compared with 1940. On yard tracks, 26 spring switches were placed in service in 1941 as compared with 19 in 1940. Mechanical facing-point locks were installed at 114 of the spring switches installed in 1941, as compared with 97 in 1940. The Missouri Pacific Lines installed a total of 43 mechanical facing-point lock assemblies on spring switches previously in service. In connection with the installation of spring switches in 1941, a total of 353 signals, including 238 high signals, 108 dwarf signals and 7 controlled electric switch lights, were installed, as compared with 336 signals in 1940.

During 1941, a total of 17 roads installed 1,163 hand-operated switch and lock movements in C. T. C. and

Automatic Block Signals Completed During 1941

Railroad	Location	Miles of Road	Number of Signals	Manufacturer
A. T. & S. F.	Trinidad, Colo.	.7d	1c	Union
	Raton, N. M.	.3s	1s	Union
		.1d	2c	
B. & G.	Bingham, Utah—Highland Boy	1.0s	2c	G.R.S.
B. & M.	Williamstown, Mass.	....	1c(7)	Union
	Baldwinville, Mass.—Royalston	4.2d	8c	G.R.S.
C. N.	Windsor Jct., N. S.	....	1s	Union
	Val Royal, Que.	1.0d	1c	.....
	Ste. Rosalie, Que.	3.0s	3c	.....
	Komoka, Ont.—Sornia	47.9d	47c	.....
	Coteau, Que.	1.0s	1c	.....
	St. James, Man.	....	1s	.....
	North Edmonton, Alta.	....	1s	G.R.S.
	South Saskatoon, Sask.	....	1s	G.R.S.
C. P.	Brownville Jct., Me.—Barnard.	8.2s	12c	G.R.S.
C. & O.	Gladstone, Va.—Iron Gate	84.0s	155c	Union
		7.0d		
	Richmond, Va.—Frederick Hall	48.0s	56c	Union
	Strathmore, Va.—Gladstone	46.0s	70c	Union
		5.0d		
	Clifton Forge, Va.—HY Cabin.	2.0d	3c(3)	Union
	Mallow, Va.—Covington	4.0d	7c(3)	Union
	Russell, Ky.—Riverton	4.0t	9c(3)	Union
C. & I. M.	Springfield, Ill.—Athens	11.0s	17c	Union
	Oakford, Ill.—Kilbourne	3.3s	6c	Union
C. & N. W.	Merrimac, Wis.—Elroy	48.2d	...(2)	.....
	Buffalo, Wis.—Wyeville	51.9s	...(2)	.....
C. & W. I.	Chicago, Ill.	.7d	9c	Union
C. I. & L.	Orleans, Ind.—Hogg	22.0s	35s	G.R.S.
	Borden, Ind.—New Albany	16.0s	17s	G.R.S.
C. R. I. & P.	Iowa Falls, Ia.—Clear Lake Jct.	43.2s	49c	Union
	Saginaw, Tex.—North Fort Worth	5.7s	7s	Union
D. & R. G. W.	Dotsero, Colo.—Bond	38.1s	43c	G.R.S.
Erie	Pymatuning, Pa.—Leavittsburg, Ohio	29.0s	11c	Union
G. N.	Nickerson, Minn.—Boylston, Wis.	22.5s	33c	G.R.S.
	New Westminster, B. C.—Endot	3.4s	13c	G.R.S.
I. C.	West Jct., Freeport, Ill.—Scales Mound	34.4s	44c	Union
L. V.	Rochester, N. Y.—Mortimer	4.3s	6s	G.R.S.
	Penn Haven Jct., Pa.—Hinkles	1.3d	1s	G.R.S.
	Barryville, Pa.—Hinkles	.5d	2s	G.R.S.
L. & N.	Athens, Ala.—Decatur Jct.	12.5d	7c	G.R.S.
M.St.P.&S.S.M.	Waupaca, Wis.	....s	4c	.....
	Ashland, Wis.	....s	6c	.....
M.-K.-T.	Pottsboro, Tex.	....	1s	Union
M. P.	DeSota, Mo.—Piedmont	85.0s	135c	G.R.S.
	Willow Glen, La.—Forest Hill	17.0s	26c	Union

Railroad	Location	Miles of Road	Number of Signals	Manufacturer
N. Y. C.	Croton, N. Y.—Manitou	5.0s	35c	G.R.S.
		6.0d		
	Batavia, N. Y.—Corfu	10.0s	36c	G.R.S.
	Glenwood, N. Y.—Hastings	3.0s	16c	G.R.S.
B. & A.	Chatham, N. Y.—Rensselaer	22.7d	23c	G.R.S.
C. C. C. & St. L.	Greensburg, Ind.—Shelbyville	14.4s	16c	Union
		4.6d		
	Tecumseh Jct., Ind.—Tecumseh	1.3s	2s	.....
I. H. B.	Calumet Pk., Ill.—Dolton	....t	9c	.....
	Dolton, Ill.—Blue Island	....d	11c	.....
	McCook, Ill.—Franklin Pk.	....d	20c	.....
P. L. & E.	Pittsburgh, Pa.—Monaca	24.5f	54c(3)	.....
N. & W.	City Point Branch, Va., M.P.3—M.P.4	1.0d	6p	Union
	Durmid Tunnel, Va.—Durmid	1.8s	4p	Union
	Walton, Va.—Christiansburg	7.0s(M)	5p	Union
P. E.	Glendale, Cal.—Burbank	3.5s	12c(6)	Union
Penna.	Lancaster, Pa.—Columbia	11.6d	6p	Union
	North East, Md.—Perryville	5.8d	8p(4)	Union
	Perryville, Md.—Oakington	3.5d	...(4)(X)	Union
	Oakington, Md.—Edgewood	12.2d	8p	Union
	Edgewood, Md.—Gunpow	4.2d	2p(4)	Union
	Bengies, Md.—North Point	6.6d	8p(4)	Union
	Winans, Md.—Odenton	10.0d	16p(4)	Union
	Bowie, Md.—Landover	8.2d	10p(4)	Union
	Landover, Md.—"C" tower, Washington, D. C.	5.8d	13p(4)	Union
	Norwood Heights, Ohio—Glen, Ind.	60.7s	34p	Union
St. L. S. W.	Illmo, Mo.—Dexter	32.0s	76c	Union
		14.0d		
	Camden, Ark.—Herbert	4.0s	8c	Union
	Bossier City, La.—Shreveport	2.0s	8c	Union
	Tyler, Tex.—Lufkin Jct.	2.0s	3s	Union
U. P.	Lookout, Wyo.—Hanna	52.6d	70c(3)	Union
	East Funston, Kan.—Fort Riley	3.8d	7c	Union
	Marengo, Wash., M.P.305.7—M.P.306.7	1.0s	2s	Union
Wabash	St. Louis, Mo.—Ferguson	5.0s	6c	Union
	Orland Park, Ill.—Chicago	11.0d	7c	Union
	Bement, Ill.—Tolono	14.5d	14c	Union
		731.0s	1,209c	
		333.2d	120p	
		4.0t	78s	
		24.5f		
		1,092.7	1,407	

Legend:
In "Miles of Road" column: s = single track, d = double tracks, t = three tracks, f = four tracks, m = middle track.
In "Number of Signals" column: s = semaphore, c = color-light, p = position light, (2) = respacing and approach electric lighting semaphore signals, (3) = semaphore signals replaced with light signals, (4) = reverse signaling installed on one track, (6) = signals transferred from abandoned line, (7) = station protection signals, (X) = no intervening automatic signals in reverse signaling.

automatic block territory to increase the safety of train movements. These movements provide facing-point lock protection equivalent to that at interlocked switches.

Highway Crossing Protection Decreased

In 1941, the installation of automatically-controlled highway-railroad crossing protective facilities at 1,120 crossings, involving 2,615 protective units, represented a decrease of 137 crossings and 391 units, as compared with 1940. A unit includes a complete flashing-light signal, with back-to-back mounting, a wig-wag signal or a gate. In 1941, 1,871 flashing-light signals were installed as compared with 2,197 in 1940. A total of 114 wig-wag signals were installed, as compared with 125 in 1940. In 1941, a total of 182 rotating disk stop sign signals were installed with flashing lights, as compared with 342 in 1940. A total of 14 traffic type stop-and-go crossing signals were installed in 1941, an increase of 1 as compared with 1940. In 1941, the number of automatically-controlled crossing gates installed totaled 425, as compared with 321 in 1940. On the majority of these projects, short-arm, one-lane gates were used in connection with standard flashing-light signals. Barriers of the type which rise up out of the pavement were installed at one crossing on the Grand Trunk Western and at one crossing on the Georgia & Florida.

Referring to the table classifying the crossing protection in various states and provinces, protection was installed at 190 crossings in Illinois, at 68 crossings in Indiana, at 63 crossings in Oklahoma and at 59 crossings in Wisconsin. Of the total of 1,120 crossings in all the states and provinces, at which protection was installed, 368 projects were paid for by the railroads, 640 by public funds of various sources, 80 jointly by railroads and public funds, 30 jointly by railroads, one by industries or individuals and one jointly by railroads and industries.

Spring Switches Installed During 1941

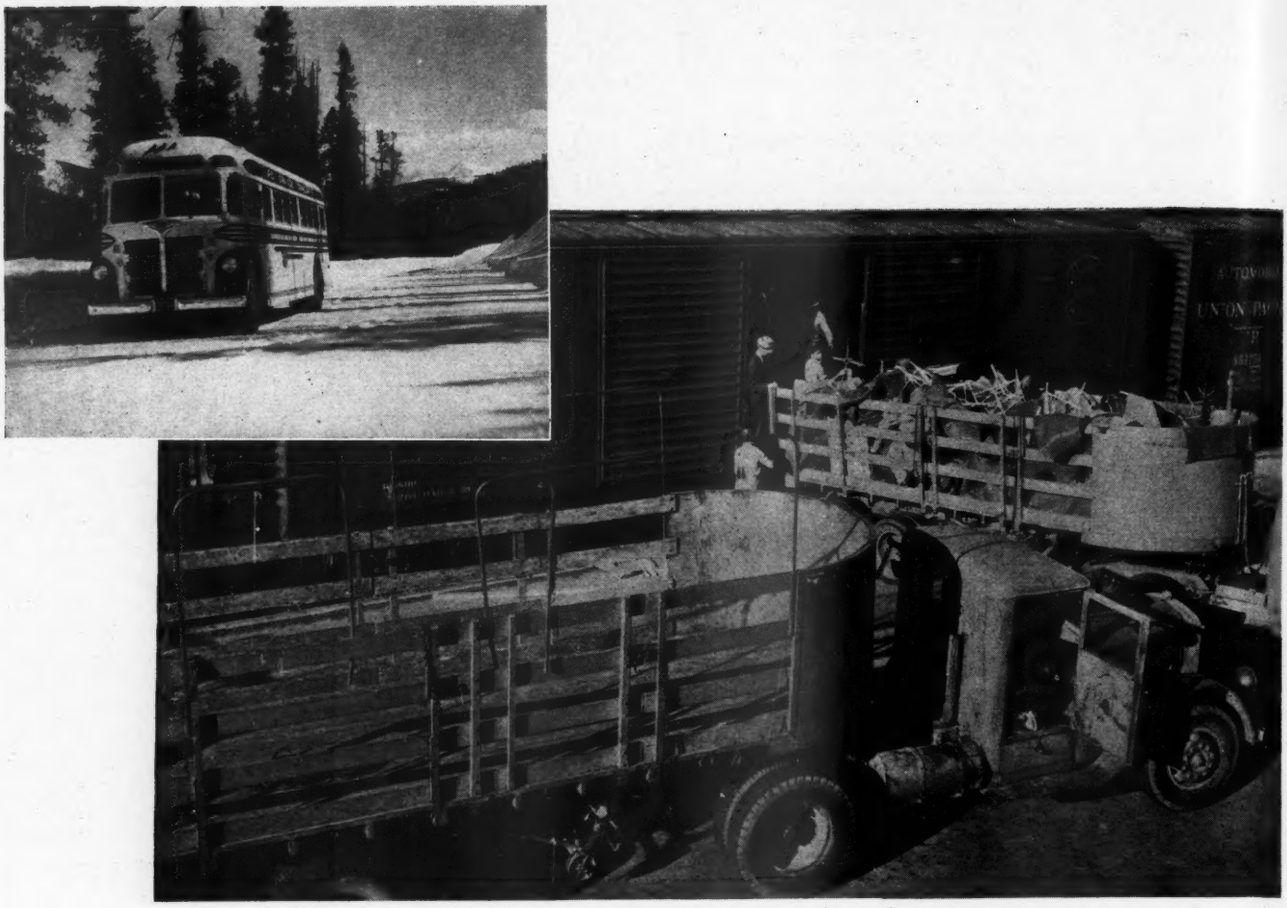
Railroad	Total No. of Spring Switches Installed	Classification as to Application: End of Passing Track	End of Double Track	Junction	Yard Track	Total No. Equipped with Facing Point Lock	Signal Protection: High Signals	Low Signals
A. T. & S. F.	28	24	..	1	3	..	21	12
A. C. L.	8	8	..	..	..	8	..	..
B. & O.	1	..	1	..	..	..	2	..
B. & G.	1	1†	..	..	..	..	..	1
B. & M.	1	..	..	..	1	..	..	..
C. N.	4	1	3	..	..	..	4	1
C. P.	2	..	1	..	1	..	2	4
C. P., L. W.	2	..	2	..	..	2	5	..
C. of G.	2	..	1#	..	1	..	..	2*
C. & O.	11	7	..	3(W)	1	3	2	11
C. & I. M.	3	3	..	..	..	..	..	..
C. & N. W.	1	..	1	..	..	1	2	1
C. B. & Q.	20	18	..	..	2	18	22	3
C. I. & L.	7	7	..	..	..	..	12	..
C. M. St. P. & P.	18	14	..	1	2	13	7	13
				1(W)				
C. R. I. & P.	3	2	..	..	1	2	..	1
C. S. S. & S. B.	2	2	..	..	..	..	..	2
D. L. & W.	2	1	1	..	..	..	3	1
								1*
D. & R. G. W.	4	4	..	..	..	4	..	..
Erie	3	3	..	..	..	3	4	3
G. N.	4	..	2	1(Y)	1(M)	3	6	3*
I. C.	17	14	2	..	1	..	17	12
Y. & M. V.	2	2	..	..	..	..	4	..
L. V.	4	..	4	..	..	2	8	4
L. & N.	32	26	2	4	..	..	48	8
M. St. P. & S. S. M.	6	6	..	..	..	5	5	6
M. P.	4	1	..	2(W)	1	3	5	..
						37(F)		
M. P. of Neb.	..	..	..	..	..	6(F)	..	..
N. C. & St. L.	1	..	..	..	1	..	..	..
N. Y. C.	4	1	3	..	..	4	1	5
B. & A.	1	..	1	..	..	..	..	1
N. Y. C. & St. L.	4	4	..	..	..	4	..	..
N. & W.	3	1	1	..	1	3	8	1
P. E.	3	..	3	..	..	..	3	3
Penna.	6	1	1	..	4	3	2	2
P. M.	5	3	2	..	..	5	2	..
Reading	2	..	1	..	1	2	..	1*
St. L.-S. F.	1	1	..	..	..	..	1	..
St. L. S. W.	11	8	2	..	1	11	11	3
Seaboard	2	2	..	..	..	2	3	..
Southern	7	5	2(X)	..	..	..	..	2
C. N. O. & T. P.	1	1	..	..	..	..	..	..
A. G. S.	4	3	1(X)	..	..	..	..	..
N. O. & N. E.	5	5	..	..	..	..	..	..
S. P. (P. L.)	11	11	..	..	..	11	20	1
T. & N. O.	2	1	..	..	1	..	2	1
T. & P.	2	..	..	..	2	..	2	1
U. P.	4	3	..	1(W)	..	1	..	4
Virginian	2	2	..	..	..	..	2	..
Wabash	1	..	1(E)	..	..	1	2	1
W. M.	1	..	..	1(W)	..	2(F)	..	..
	275	195	33	6	25	114	238	108
		1†	1#	8(W)	1(M)	45(F)		7*
			3(X)	1(Y)				
		196	1(E)		26	159		115
			38	15				

Legend:
† = One end of crossover between passing track and main track.
# = In yard.
(W) = Wye track.
(Y) = Yard lead junction.
(M) = Yard lead to main line.
(X) = Crossover.
(E) = Equilateral turnout with 33-ft. points.
(F) = Facing-point lock assemblies added to spring switches installed previously.
* = Controlled electric switch light.

Crossing Protection Installed in Different States and Provinces Separated as to Sources of Funds

State or Province	No. of Crossings	Source of Funds: Railroad	Public Funds of Any Source	Joint Railroad and Public Funds	Total No. of Protective Units
Ala.	5	2	3	..	14
Ark.	19	1	18	..	45
Cal.	40	16	16	8	71
Colo.	3	..	3	..	6
Conn.	4	4	..	..	9
Del.	4	2	2	..	7
Fla.	27	4	23	..	71
Ga.	17	4	13	..	52
Idaho	2	..	2	..	4
Ill.	190	30	90	40	469
		30*			
Ind.	68	26	42	..	218
Iowa	33	4	29	..	77
Kan.	35	21	14	..	71
Ky.	17	13	4	..	45
La.	20	7	13	..	43
Maine	2	..	2	..	4
Md.	6	2	4	..	14
Mass.	14	8	6	..	24
Mich.	51	9	27	15	113
Minn.	16	3	13	..	35
Miss.	3	..	3	..	6
Mo.	13	10	2	1(J)	36
Mont.	3	..	3	..	6
Neb.	33	3	30	..	75
Nev.	4	..	4	..	8
N. H.	4	1	3	..	9
N. J.	16	14	2	..	39
N. M.	3	..	3	..	6
N. Y.	45	45	..	..	114
N. C.	28	..	28	..	69
Ohio	49	47	2	..	119
Okla.	63	..	63	..	127
Ore.	5	..	5	..	16
Pa.	35	27	3	4	81
			1†		
S. C.	22	..	22	..	59
S. D.	10	..	10	..	22
Tenn.	5	2	3	..	12
Tex.	38	29	9	..	37
Utah	46	..	46	..	112
Vt.	1	1	..	..	2
Va.	20	10	10	..	42
Wash.	5	2	3	..	9
W. Va.	15	8	7	..	37
Wis.	59	12	47	..	143
Wyo.	3	..	3	..	6
Alta.	4	..	..	4	4
B. C.	1	1	..	..	2
Ont.	8	..	..	8	9
Que.	6	..	5	1	16
Totals	1,120	368	640	80	2,615
		30*	1†	1(J)	
		398	641	81	

Legend:
† = Installation paid for by industries or individuals.
* = Installation paid for jointly with other railroads.
(J) = Installation paid for jointly with industries.



The Use of Auxiliary Buses and Trucks Has Been the Means of Saving Much Rail Equipment During 1941

Co-ordinated Service Assumes Important Role

Faster deliveries of important defense traffic and car-day savings made possible by rail-highway operations

By Charles Layng
Motor Transport Editor

RAIL-HIGHWAY co-ordinated operations assumed a new importance in 1941, as a result of the emergency created by the war program. The flexibility of such service enables faster deliveries of L. C. L. shipments that are important to defense industries. At the same time, with heavy traffic putting a premium on car-days saved, such operations are playing a highly important part in releasing cars promptly by eliminating the necessity for operating lightly-loaded cars to local stations. Under the plan of handling merchandise to and from concentration and distribution points by highway trucks, cars are being released for further service at places where, in general, they can be put to immediate use. Conversely, normal car routes are not dislocated by the scattering of cars to small, local stations from which, ordinarily, there is no immediate return loading. A further important factor is that local freight train schedules are materially speeded up by permitting such trains to handle carload business principally, switching is avoided at outlying points, where it is often a slow and costly procedure, and main line trains are operated with fewer intermediate stops, all of which save not only car days, but also motive power. In these days when some railways are even bringing back into road service locomotives that have been used as stationary power plants for years, this saving in power is quite as important as the saving in car days.

Insofar as they were permitted to do so under the

slow processes of the Interstate Commerce Commission, the railways expanded their rail-highway co-ordinations to the fullest possible extent during 1941. After some years of deliberation, the Commission rendered an exceedingly important decision last spring in case MC-61438, which referred specifically to the Kansas City Southern Transport Company, but also embraced petitions of the Seaboard, the Chicago, Rock Island & Pacific, and the Louisville & Nashville. This involved relief from the famous "Condition 3," reading as follows: "Shipments transported by the applicant shall be limited to those which it receives from or delivers to the railway, under a through bill of lading covering, in addition to movement by applicant, a prior or subsequent rail haul." Since this condition compelled the railways to supply both train and truck service on certain sections of the line, it acted as a powerful deterrent to the spread of rail-highway co-ordination. Now, however, subject to review by the Commission, of course, the condition of prior or subsequent rail haul has been recognized as uneconomic and as penalizing such operations unjustly.

On the other hand, last fall, the Commission suddenly adopted a new attitude which, if sustained, will prove detrimental to further expansion of co-ordinated service. In the case in point, which will naturally serve as a precedent, the railway involved operates two sections of its lines practically independent of each other. On one part of the system, a trucking subsidiary was formed which conducted its operations entirely within the confines of one state. An entirely separate trucking subsidiary of the same railway conducted operations in another state. None of the truck routes of the two subsidiaries come within 500 miles of each other, and there is absolutely no connection between them except that they are owned by the same parent railway. Nonetheless, the Commission has advanced the somewhat legalistic and pedantic view that this slender connection is sufficient to class them as interstate carriers. When, eventually, the case is decided, the result will have an important bearing on future rail-highway co-ordination.

Truck Services

Throughout the year, there has been a steady increase in rail-highway co-ordination. Since, by now, practically all of the railways engage in such operations, this has taken the form of expansion of existing services. As an example, the Pacific Motor Truck Company, a subsidiary of the Southern Pacific, increased its services materially during 1941, and now operates a total of 746 automotive units, making about 13½ million vehicle miles and carrying about three-quarters of a million tons of merchandise annually. In California, Oregon, Nevada and Arizona, the truck subsidiary route mileage equals that of the parent railway (approximately 7,500 miles) and with further expansion planned shortly, it will exceed the railway mileage in these states. The P. M. T. is also handling pick-up and delivery service in some cities, and in Los Angeles, for example, as many as 150 highway units are frequently required for this service.

The Gulf, Mobile & Ohio also expanded its services materially during the year. Before the consolidation of the G. M. & N. and the M. & O. to form the new system, the former road had a comprehensive co-ordinated service. This has been expanded and new routes have been installed along the former Mobile & Ohio, so that, at present, almost every one of the 2,000 miles of the combined system is paralleled by truck routes serving the local stations from and to several specified concentration and distribution points. This road has been particularly successful in the operation of feeder truck routes along branch-lines or to points not served by any railroad. The Gulf Transport Company now operates nearly 100 highway freight units, giving intercity truck-rail service to about 325 communities in Mississippi, Alabama, Tennessee, Illinois and Louisiana.

A comprehensive plan for co-ordinated service was worked out by the Illinois Central during the year. This road has been operating such service in the vicinity of Carbondale, Ill., for some time, and the success of these operations prompted the further expansion. Most of the hearings have been concluded and, if the decisions are favorable, the I. C. will shortly have a co-ordinated rail-highway service along its entire main line and several branches between Kankakee, Ill., and Jackson, Miss., as well as along the Y. & M. V. main line and certain branches between Memphis, Tenn., and Vicksburg, Miss., and between Meridian, Miss., and Vicksburg.

Large expansions of rail-highway co-ordinated projects have also taken place in Texas this year. The Southern Pacific, the Missouri Pacific and the Texas & Pacific have all been active in extending the scope of such services in that state, and all three have built up large fleets, which give more and more communities each year the benefits of co-ordinated service for L. C. L. freight.

These examples are typical of the many expansions that are taking place in all sections of the country. They have been brought about not only by the intrinsically sound economy of such operations as to expense of operation and service rendered, but also because of the saving in car days, which has assumed a new importance in 1941. Since it appears that, beyond any question of doubt, this importance will be magnified in 1942, further expansions may be predicted during the coming year.

Bus Services

Since the railways are even more firmly entrenched in the bus business than in highway freight transportation, the history in 1941 has also been largely one of expansion rather than of new enterprises. The large increase in tourist travel also gave considerable impetus to the bus "detours" operated to scenic spots in national parks and elsewhere in connection with rail travel. A successful enterprise inaugurated during the year was the "Sky-High" tour arrangement operated by the Rio Grande Trailways to Mesa Verde National Park and other scenic territory in Colorado. The companies serving Yellowstone, Yosemite and Glacier parks all report successful years, as do the California Parlor Car Tours and the Indian Detours in New Mexico.

Such all-year commercial operations as the railway subsidiary members of the National Trailways and the Greyhound Lines increased the number of schedules in many places. These companies also engaged in an elaborate station improvement program during the year, although priorities interfered to some extent with the purchase of new buses and the use of aluminum for bus bodies was, of course, discontinued. However, numerous orders for buses were placed and filled during the year, subject, of course, to some delays. The latest of these orders was that of the Burlington Transportation Company for 10 modern buses, which were scheduled to be delivered about the first of the year.

A form of bus operation that received considerable impetus during the year was the feeder connection for streamlined trains. By the use of such buses, the benefits of high speeds in modern trains were made available to a far larger territory than would have been possible under all-rail operation.

As with freight equipment, the demand for passenger

equipment has been heavy, and gives every indication of becoming still greater. In these days of concentration on war-time needs, the operation of a freight car carrying only a few hundred pounds of lading or of a railway coach with only a few passengers is not consistent with efficient victory effort. The use of buses and trucks in co-ordinated service for handling such loads is far more effective and should show a material increase in 1942.

The accompanying list of orders for highway vehicles shows that during 1941 railroads and their reporting subsidiaries and affiliates placed orders for a total of 641 motor buses, 4,106 units of highway freight equipment (3,022 trucks, 501 tractors and 583 trailers), 385 automobiles, and two miscellaneous vehicles. In addition four combination vehicles for both passenger and freight service were ordered. This compares with 646 motor buses, 2,751 units of highway freight equipment and 302 automobiles ordered during 1940. Canadian roads and their affiliates placed orders for 8 buses during the year.

Orders for Highway Vehicles

Purchaser	No.	Type of Vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Alabama Great Southern	1	Truck	1½ ton	Co. Business	Int. Harvester
Alabama, Tennessee & Northern	1	Automobile	5	Co. Business	Plymouth
	1	Automobile	5	Co. Business	Chevrolet
Alaska	1	Truck	1½ ton	Co. Business	General Motors
	1	Truck	¾ ton	Co. Business	Dodge
	1	Truck	1 ton	Co. Business	Dodge
Alton & Southern	4	Automobile	5	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Packard
	1	Automobile	7	Co. Business	Chevrolet
	1	Automobile	2	Co. Business	Chevrolet
Atchison, Topeka & Santa Fe					
Santa Fe Trail Transportation Co.	40	Bus	37	Rev.	a.c.f. Motors
	22	Truck	½ ton	Rev.	Ford
	22	Tractor	2½ ton	Rev.	General Motors
	10	Tractor	2 ton	Rev.	Ford
	3	Tractor	3 ton	Rev.	Int. Harvester
	16	Trailer	3 ton	Rev.	Fruehauf
	8	Automobile	5	Co. Business	Chrysler
Santa Fe Transportation Co. (Delaware)	1	Truck	1½ ton	Rev.	Ford
Santa Fe Transportation Co. (California)	1	Truck	1½ ton	Rev.	Ford
	1	Truck	1½ ton	Rev.	Chrysler
	1	Truck	1½ ton	Rev.	Studebaker
	1	Truck	3 ton	Rev.	Chrysler
	1	Tractor	2½ ton	Rev.	Gen. Motors
Baltimore & Ohio					
West Virginia Transportation Co.	3	Bus	37	Rev.	White
Bangor & Aroostook	1	Bus	29	Rev.	a.c.f. Motors
Bessemer & Lake Erie	1	Truck	¾ ton	Co. Business	Chevrolet
	1	Truck	light	Co. Business	Chevrolet
	2	Automobile	.....	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Chevrolet
Boston & Maine	1	Truck	2 ton	Co. Business	Ford
	1	Truck	3 ton	Co. Business	Ford
	1	Truck	4 ton	Co. Business	Ford
Boston & Maine Transportation Co.	13	Bus	29	Rev.	General Motors
	8	Bus	32	Rev.	General Motors
	16	Truck	8 ton	Rev.	General Motors
	4	Tractor	10 ton	Rev.	General Motors
	5	Trailer	8 ton	Rev.	W. F. Lacey & Sons
	2	Automobile	10	Rev.	.....
Central of Georgia	1	Automobile	5	Co. Business	Chevrolet
Central of New Jersey	3	Truck	1 ton	Co. Business	Dodge
Chesapeake & Ohio	6	Truck	½ ton	Co. Business	Chevrolet
	3	Truck	½ ton	Co. Business	Dodge
	1	Truck	1½ ton	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	Int. Harvester
	1	Truck	.....	Co. Business	Int. Harvester
	6	Automobile	.....	Co. Business	Ford
	1	Automobile	.....	Co. Business	Chevrolet
Chicago & Western Indiana	1	Truck	1 ton	Co. Business	Int. Harvester
	1	Truck	1½ ton	Co. Business	Int. Harvester
Chicago, Burlington & Quincy					
Burlington Transportation Co.	16	Bus	33	Rev.	a.c.f. Motors
	10	Bus	33	Rev.	General Motors
	1	Bus	16	Rev.	Kalamazoo
	8	Truck	1½ ton	Rev.	Chrysler
	4	Truck	1½ ton	Rev.	Ford
	13	Tractor	3 ton	Rev.	White
	9	Tractor	3 ton	Rev.	Int. Harvester
	33	Trailer	10 ton	Rev.	Fruehauf
Chicago, Indianapolis & Louisville	1	Truck	1½-2 ton	Co. Business	Int. Harvester
Chicago, Milwaukee, St. Paul & Pacific	1	Bus	14	.....	.....
	1	Bus	20	.....	.....
	7	Truck	¾ ton	.....	.....
	6	Truck	½ ton	.....	.....
	5	Truck	1½ ton	.....	.....
	11	Automobile	5	.....	.....
Chicago, North Shore & Milwaukee	3	Bus	32	Rev.	White
	3	Bus	31	Rev.	a.c.f. Motors
	1	Truck	1 ton	Co. Business	Int. Harvester
	1	Truck	¾ ton	Co. Business	Int. Harvester
	1	Truck	2-3 ton	Co. Business	Int. Harvester
Chicago, Rock Island & Pacific	2	Truck	3½ ton	Co. Business	.....
	1	Truck	¾ ton	Co. Business	.....
	7	Automobile	5	Co. Business	.....
Cincinnati, New Orleans & Texas Pacific	4	Truck	1½ ton	Co. Business	Int. Harvester
Cumberland & Pennsylvania	1	Truck	1½ ton	Co. Business	Chevrolet
	1	Automobile	2	Co. Business	Chevrolet
Delaware, Lackawanna & Western	2	Truck	½ ton	Co. Business	.....
	1	Truck	1½ ton	Co. Business	.....
Denver & Rio Grande Western	4	Truck	1½ ton	Co. Business	.....
	3	Truck	¾ ton	Co. Business	.....
	1	Automobile	9	Co. Business	.....
Denver, Colorado Springs & Pueblo Motor Way, Inc.	2	Bus	29	Rev.	.....
	2	Bus	37	Rev.	.....
Rio Grande Motorway, Inc.-Denver, Salt Lake & Pacific Stages	5	Bus	29	Rev.	.....
	6	Truck	1½ ton	Rev.	.....
	1	Truck	½ ton	Rev.	.....
	2	Tractor (Diesel)	3½ ton	Rev.	.....
	4	Trailer	3 ton	Rev.	.....

Continued on fourth right-hand page

Purchaser	No.	Type of Vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Detroit & Mackinac	1	Truck	1½ ton	Rev.	Dodge
	1	Automobile	5	Co. Business	Plymouth
Detroit, Toledo & Ironton	12	Automobile	5	Co. Business	.....
	1	Automobile	3	Co. Business	.....
Elgin, Joliet & Eastern	1	Truck	2 ton	Co. Business	Int. Harvester
Erie	6	Truck	1½ ton	Co. Business	Chevrolet
	2	Truck	½ ton	Co. Business	Chevrolet
	1	Truck	¾ ton	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	Dodge
	26	Automobile	5	Co. Business	Chevrolet
	13	Automobile	5	Co. Business	Plymouth
	3	Automobile	2	Co. Business	Chevrolet
	3	Automobile	2	Co. Business	Ford
	2	Automobile	5	Co. Business	Dodge
	1	Automobile	2	Co. Business	Plymouth
	1	Automobile	5	Co. Business	Buick
	1	Automobile	5	Co. Business	Oldsmobile
	1	Automobile	5	Co. Business	Ford
	1	Automobile	5	Co. Business	Nash
	1	Automobile	2	Co. Business	Nash
	1	Automobile	5	Co. Business	DeSoto
Gulf Coast Lines	2	Automobile	.....	Co. Business	Ford
	1	Automobile	.....	Co. Business	General Motors
Gulf, Mobile & Ohio					
Gulf Transport Co.	7	Bus	29	Rev.	General Motors
	5	Bus	29	Rev.	Flxible
	3	Bus	33	Rev.	General American Aerocoach Co.
	2	Bus	16	Rev.	Fitzjohn
	1	Bus	25	Rev.	Flxible
	13	Tractor	2-3 ton	Rev.	General Motors
	9	Tractor	2 ton	Rev.	General Motors
	4	Tractor	3½ ton	Rev.	General Motors
	2	Tractor	3-4 ton	Rev.	Int. Harvester
	1	Tractor	1½-2 ton	Rev.	General Motors
	1	Tractor	1½-2 ton	Rev.	Int. Harvester
	23	Trailer	.....	Rev.	Carter Mfg. Co.
	4	Trailer	.....	Rev.	Dorsey Mfg. Co.
	3	Trailer	.....	Rev.	Gulf Trailer & Equipment Co.
	2	Trailer	.....	Rev.	Nabors
Illinois Terminal	1	Bus	24	Rev.	Ford
	1	Bus	24	Rev.	General Motors
International-Great Northern	2	Truck	.....	Co. Business	General Motors
	1	Truck	.....	Co. Business	Ford
	4	Automobile	.....	Co. Business	General Motors
	1	Automobile	.....	Co. Business	Ford
Interstate	2	Automobile	2	Co. Business	Chevrolet
Kansas City Southern					
Kansas City Southern Transport Co.	3	Tractor	1½ ton	Rev.	White
	2	Tractor	1½ ton	Rev.	Chevrolet
	1	Tractor	1½ ton	Rev.	Ford
	1	Tractor	1½ ton	Rev.	General Motors
	2	Trailer	5 ton	Rev.	Nabors
	1	Trailer	5 ton	Rev.	Freuhauf
	1	Trailer	5 ton	Rev.	Ft. Smith Structural Steel
Long Island	2	Truck	1½ ton	Co. Business	.....
	1	Truck	3 ton	Co. Business	.....
Maine Central	2	Truck	½ ton	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	Chevrolet
Maine Central Transportation Co.	4	Bus	11	Rev.	Fitzjohn
	2	Bus	29	Rev.	General Motors
	1	Truck	1½ ton	Rev.	Chevrolet
Mississippi Central	1	Automobile	5	Co. Business	Mercury
	1	Automobile	5	Co. Business	Chevrolet
Missouri-Kansas-Texas	1	Automobile	3	Co. Business	Ford
	1	Automobile	5	Co. Business	Chevrolet
Missouri Pacific	2	Truck	1½ ton	Co. Business	Ford
	1	Truck	½ ton	Co. Business	Ford
	1	Truck	½ ton	Co. Business	Chevrolet
	1	Truck	2 ton	Co. Business	General Motors
	37	Automobile	5	Co. Business	Chevrolet
	7	Automobile	5	Co. Business	Ford
	5	Automobile	5	Co. Business	Plymouth
	1	Automobile	5	Co. Business	Buick
Monongahela	2	Truck	½ ton	Co. Business	Ford
	1	Truck	¾ ton	Co. Business	Ford
Nevada Northern	2	Bus	21	Rev.	General Motors
New York Central	11	Truck	2 ton	Co. Business	.....
	9	Truck	1½ ton	Co. Business	.....
	6	Truck	½ ton	Co. Business	.....
	6	Truck	1 ton	Co. Business	.....
	1	Truck	4 ton	Co. Business	.....
	1	Truck	3 ton	Co. Business	.....
	1	Truck	¾ ton	Co. Business	.....
Central Greyhound Lines	19	Bus	37	Rev.	General Motors
	13	Bus	41	Rev.	General Motors
New York, Chicago & St. Louis	2	Truck	½ ton	Co. Business	Ford
	1	Truck	1¼ ton	Co. Business	Int. Harvester
	1	Truck	1½ ton	Co. Business	Dodge
	2	Automobile	5	Co. Business	Chevrolet
New York, New Haven & Hartford	33	Truck	2½ ton	Co. Business	.....
	15	Truck	¾ ton	Co. Business	.....
	5	Truck	3 ton	Co. Business	.....
	2	Truck	1 ton	Co. Business	.....
	2	Truck	1½ ton	Co. Business	.....
	2	Truck	½ ton	Co. Business	.....
	11	Automobile	5	Co. Business	.....
	6	Automobile	8	Co. Business	.....
	1	Automobile	6	Co. Business	.....
New England Transportation Co.	20	Bus	37	Rev.	.....
	25	Truck	7½ ton	Rev.	.....
	30	Tractor	10 ton	Rev.	.....
	20	Trailer	11½ ton	Rev.	.....
	2	Automobile	5	Co. Business	.....
	1	Automobile	2	Co. Business	.....
Connecticut Company	132	Bus	36	Rev.	.....
	13	Bus	28	Rev.	.....
	5	Bus	40	Rev.	.....
	1	Truck	3 ton	Co. Business	.....
	1	Truck	½ ton	Co. Business	.....

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Set the Pace

WITH THESE FRANKLIN

For capacity

TO HAUL HEAVY LOADS AT HIGH SPEEDS > > > >

The Franklin System of Steam Distribution makes available 30 to 40% more horsepower for revenue work — without increasing the size of the locomotive. This large increase is accomplished by means of the following features:

1. Separation of valve events, so that admission, cut-off, release and compression are independently controlled.
2. Absolutely fixed valve events at all speeds and all cut-offs.
3. Large inlet and exhaust passages and improved steam flow.
4. Reduced cylinder clearance volume.
5. Reduced weight of moving masses and reduced mechanical friction.

Through the results obtained by the application of The Franklin System of Steam Distribution it is now possible to build smaller locomotives with the same power or the same size locomotives with even greater power.

FRANKLIN RAILWAY SUPPLY

for '42 . . .

"EXTRA CAPACITY" DEVICES

For capacity

TO START AND ACCELERATE HEAVY LOADS

With the increasing demand for moving heavy loads at high speeds, the problem of starting and accelerating the heavier loads becomes increasingly acute. The new type "E" Booster will effectively solve this problem. The added starting tractive effort that it makes available can be utilized up to a speed of 35 M.P.H. and it can be cut in at a speed of 22 M.P.H. The added tractive effort of Booster Power gives your locomotives the "extra" power needed to start today's heavier loads rolling. As speed drops on a grade the engineer can cut-in the Booster and gain added tractive effort until the locomotive reaches normal running speed again.

Install Locomotive Boosters on new or old power and get the added starting effort so necessary in meeting today's time schedules.

COMPANY, INC.

NEW YORK
CHICAGO
MONTREAL

Purchaser	No.	Type of Vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
County Transportation Co.	5	Bus	34	Rev.	.....
	5	Bus	28	Rev.	.....
Berkshire Street Railway	8	Bus	27	Rev.	.....
Niagara Junction	2	Truck	.....	Co. Business	Chevrolet
Norfolk & Western	2	Truck	¾ ton	Co. Business	Ford
	2	Truck	¾ ton	Co. Business	Chevrolet
	1	Truck	½ ton	Co. Business	Ford
	1	Truck	1½ ton	Co. Business	Ford
	1	Truck	½ ton	Co. Business	Dodge
	1	Truck	1½ ton	Co. Business	Chevrolet
	2	Automobile	5	Co. Business	Chevrolet
	2	Automobile	5	Co. Business	Ford
	1	Ambulance	.....	Co. Business	Magic City Motor Co.
Norfolk Southern					
Norfolk Southern Bus Corp.	4	Bus	27	Rev.	Ford
	3	Bus	33	Rev.	a.c.f. Motors
	2	Bus	37	Rev.	C. D. Beck & Co.
	1	Bus	33	Rev.	C. D. Beck & Co.
	1	Bus	36	Rev.	a.c.f. Motors
	1	Bus	26	Rev.	a.c.f. Motors
	2	Truck	1½ ton	Rev.	Chevrolet
	3	Tractor	2 ton	Rev.	Autocar Sales & Service Co.
	3	Trailer	3 ton	Rev.	Fruehauf
	1	Automobile	7	Rev.	Ford
Northeast Oklahoma	1	Bus	24	Rev.	General Motors
Northern Pacific					
Northern Pacific Transport Co.	3	Bus-Truck	5 Pass.-2 ton	Rev.	Int. Harvester
	1	Bus-Truck	6 Pass.-4 ton	Rev.	General Motors & Brown Industries
	1	Bus	29	Rev.	General Motors
	3	Truck	7 ton	Rev.	Kenworth Motor Truck Co.
	1	Tractor	.....	Rev.	Int. Harvester
	1	Tractor	.....	Rev.	General Motors
	3	Trailer	5 ton	Rev.	Brown Industries
	1	Trailer	5 ton	Rev.	Fruehauf
	1	Automobile	5	Co. Business	Chrysler
	1	Automobile	5	Co. Business	Chevrolet
Northwestern Improvement Co.	1	Truck	1½ ton	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	Dodge
Yellowstone Park Co.	4	Truck	7 ton	Rev.	White
	1	Truck	1 ton	Co. Business	Ford
Oahu Ry. & Land Co.	8	Bus	29	Rev.	a.c.f. Motors
	1	Truck	5 ton	Rev.	General Motors
	1	Tractor	.....	.....	Allis Chalmers
Pennsylvania	21	Truck	1½ ton	Co. Business	.....
	8	Truck	¾ ton	Co. Business	.....
	7	Truck	1 ton	Co. Business	.....
	5	Truck	½ ton	Co. Business	.....
	4	Truck	2 ton	Co. Business	.....
	4	Truck	3 ton	Co. Business	.....
	3	Truck	4 ton	Co. Business	.....
	2	Truck	5 ton	Co. Business	.....
	1	Truck	2½ ton	Co. Business	.....
	8	Automobile	5	Co. Business	.....
	2	Automobile	7	Co. Business	.....
	2	Automobile	8	Co. Business	.....
	1	Fire Engine	.....	Co. Business	.....
Pennsylvania affiliates	69	Bus	43	Rev.	.....
	20	Bus	29	Rev.	.....
	3	Bus	37	Rev.	.....
	221	Truck	Less than 3 ton	Rev.	.....
	12	Truck	3-5 ton	Rev.	.....
	3	Truck	Over 10 ton	Rev.	.....
	1	Truck	5-10 ton	Rev.	.....
	137	Tractor	Less than 3 ton	Rev.	.....
	22	Tractor	3-5 ton	Rev.	.....
	13	Tractor	5-10 ton	Rev.	.....
	6	Tractor	Over 10 ton	Rev.	.....
	103	Trailer	Over 10 ton	Rev.	.....
	57	Trailer	5-10 ton	Rev.	.....
	17	Trailer	3-5 ton	Rev.	.....
	19	Automobile	.....	Co. Business	.....
Pennsylvania-Reading Seashore Lines	2	Truck	1 ton	Co. Business	Dodge
Pere Marquette	2	Truck	½ ton	Co. Business	Ford
	1	Truck	1¼ ton	Co. Business	General Motors
	1	Truck	½ ton	Co. Business	Chevrolet
	1	Automobile	2	Co. Business	Chevrolet
Pittsburgh, Shawmut & Northern	1	Truck	1½ ton	Co. Business	Ford
Portland Terminal Company	2	Truck	2½ ton	Co. Business	General Motors
Railway Express Agency	2301	Truck	Light	.....	.....
	120	Tractor	.....	.....	.....
	243	Trailer	.....	.....	.....
	59	Automobile	.....	.....	.....
Reading Company					
Reading Transportation Co.	4	Bus	33	Rev.	General Motors
	4	Bus	29	Rev.	Ford
	3	Bus	29	Rev.	General Motors
	3	Bus	29	Rev.	Flxible
Richmond, Fredericksburg & Potomac					
Richmond Greyhound Lines	7	Bus	41	Rev.	General Motors
	5	Bus	37	Rev.	General American Aerocoach Co.
St. Louis-San Francisco					
Frisco Transportation Co.	4	Bus	11	Rev.	Int. Harvester
	3	Bus	20	Rev.	Chevrolet
	2	Bus	27	Rev.	General Motors
	2	Tractor	3 ton	Rev.	Int. Harvester
	2	Tractor	1½ ton	Rev.	White
	2	Trailer	9 ton	Rev.	Superior Trailer Mfg. Co.
	2	Trailer	9 ton	Rev.	Springfield Wagon & Trailer Co.
St. Louis Southwestern	1	Automobile	5	Co. Business	Buick
Southwestern Transportation Co.	6	Truck	1½ ton	Rev.	Chevrolet
	4	Truck	1 ton	Rev.	Ford
	17	Tractor	3 ton	Rev.	White
	6	Tractor	3 ton	Rev.	Int. Harvester
	3	Trailer	1½ ton	Rev.	Carter
	1	Trailer	1½ ton	Rev.	Nabors
	1	Automobile	5	Co. Business	Pontiac
	1	Automobile	5	Co. Business	Ford

Purchaser	No.	Type of Vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Southwestern Greyhound Lines, Inc.	30	Bus	37	Rev.	.....
	3	Bus	25	Rev.	.....
	1	Bus	33	Rev.	.....
	12	Automobile	5	Co. Business	.....
Seaboard Air Line	1	Bus	10	Rev.	Int. Harvester
	4	Truck	1½ ton	Co. Business	Int. Harvester
	1	Truck	1½ ton	Rev.	Int. Harvester
	1	Truck	½ ton	Co. Business	Int. Harvester
	1	Truck	1½ ton	Rev.	Chevrolet
	1	Truck	1½ ton	Co. Business	Dodge
	1	Truck	½ ton	Co. Business	Ford
	1	Truck	½ ton	Co. Business	Studebaker
	2	Tractor	2-3 ton	Rev.	Int. Harvester
	1	Trailer	10 ton	Rev.	Dorsey Bros.
	1	Trailer	10 ton	Rev.	Fruehauf
	16	Automobile	5	Co. Business	Chevrolet
	5	Automobile	5	Co. Business	Plymouth
	2	Automobile	5	Co. Business	Ford
	2	Automobile	2	Co. Business	Ford
	1	Automobile	2	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Buick
Southern	2	Bus	31	Co. Business	Int. Harvester
	1	Bus	21	Co. Business	Chevrolet
	16	Truck	1½ ton	Co. Business	Int. Harvester
	1	Truck	¾ ton	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	Int. Harvester
Southern Pacific					
Pacific Greyhound Lines	42	Bus (Diesel)	41	Rev.	General Motors
	24	Bus (Diesel)	45	Rev.	General Motors
	16	Bus	25	Rev.	General Motors
	5	Bus	25	Rev.	Flxible
	5	Bus	45	Rev.	Mack
	2	Automobile	5	Co. Business	Chevrolet
Tennessee Central	1	Truck	½ ton	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Chevrolet
Texas & New Orleans	1	Truck	1 ton	Co. Business	Chevrolet
	1	Automobile	6	Co. Business	Ford
Southern Pacific Transport Co.	2	Truck	1½ ton	Rev.	Ford
	1	Truck	1½ ton	Rev.	Chevrolet
	1	Truck	1½ ton	Rev.	Mack
	1	Truck	1½ ton	Rev.	Dodge
	6	Tractor	1½ ton	Rev.	Chevrolet
	2	Tractor	1½ ton	Rev.	Int. Harvester
	1	Tractor	1½ ton	Rev.	Mack
	4	Trailer	1½ ton	Rev.	Lufkin Fdy. & Machy. Co.
	3	Trailer	1½ ton	Rev.	Nabors
	1	Automobile	3	Co. Business	Plymouth
Texas & Pacific	3	Truck	¾ ton	Co. Business	Ford
	9	Automobile	5	Co. Business	Ford
	4	Automobile	5	Co. Business	General Motors
	3	Automobile	2	Co. Business	Ford
Texas & Pacific Motor Transport Co.	26	Truck	2½ ton	Rev.	Ford
	9	Truck	2½ ton	Rev.	Chevrolet
	1	Truck	2½ ton	Rev.	White
	1	Truck	1½ ton	Rev.	Int. Harvester
	15	Tractor	2½ ton	Rev.	Int. Harvester
	9	Tractor	2½ ton	Rev.	General Motors
	3	Tractor	2½ ton	Rev.	Ford
	1	Tractor	2½ ton	Rev.	Chevrolet
	25	Trailer	7 ton	Rev.	Nabors
	1	Automobile	2	Co. Business	Ford
	1	Automobile	5	Co. Business	Chevrolet
Toledo Terminal	1	Automobile	5	Co. Business	Chevrolet
Union	1	Truck	.....	Co. Business	White
	3	Automobile	.....	Co. Business	Ford
Union Pacific	1	Bus	11	Rev.	General Motors
	1	Bus	9	Rev.	General Motors
	5	Truck	1½ ton	Co. Business	General Motors
	4	Truck	2/3 ton	Co. Business	Int. Harvester
	3	Truck	¾ ton	Co. Business	General Motors
	2	Truck	½ ton	Co. Business	General Motors
	1	Truck	1 ton	Co. Business	Int. Harvester
	1	Truck	3 ton	Co. Business	Int. Harvester
	3	Automobile	5	Co. Business	Ford
	1	Automobile	3	Co. Business	General Motors
Utah Parks Co.	3	Bus	29	Rev.	General Motors
	1	Truck	1½ ton	Co. Business	Dodge
	1	Truck	2 ton	Co. Business	Dodge
	1	Truck	1½ ton	Co. Business	Ford
	2	Automobile	5	Rev.	Chevrolet
Western Maryland	4	Truck	1½ ton	Co. Business	Int. Harvester
	2	Truck	1½ ton	Co. Business	Dodge
	1	Truck	1½ ton	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Plymouth
	1	Automobile	.....	Co. Business	Ford

Canada

British Columbia Electric	2	Bus	21	Rev.	Ford
Dominion Atlantic	1	Bus	33	Rev.	General Motors
Quebec Central					
Quebec Central Transportation Co.	2	Bus	18	Rev.	General Motors
	1	Bus	33	Rev.	General Motors
	1	Bus	24	Rev.	General Motors
Temiskaming & Northern Ontario	1	Bus	33	Rev.	Reo

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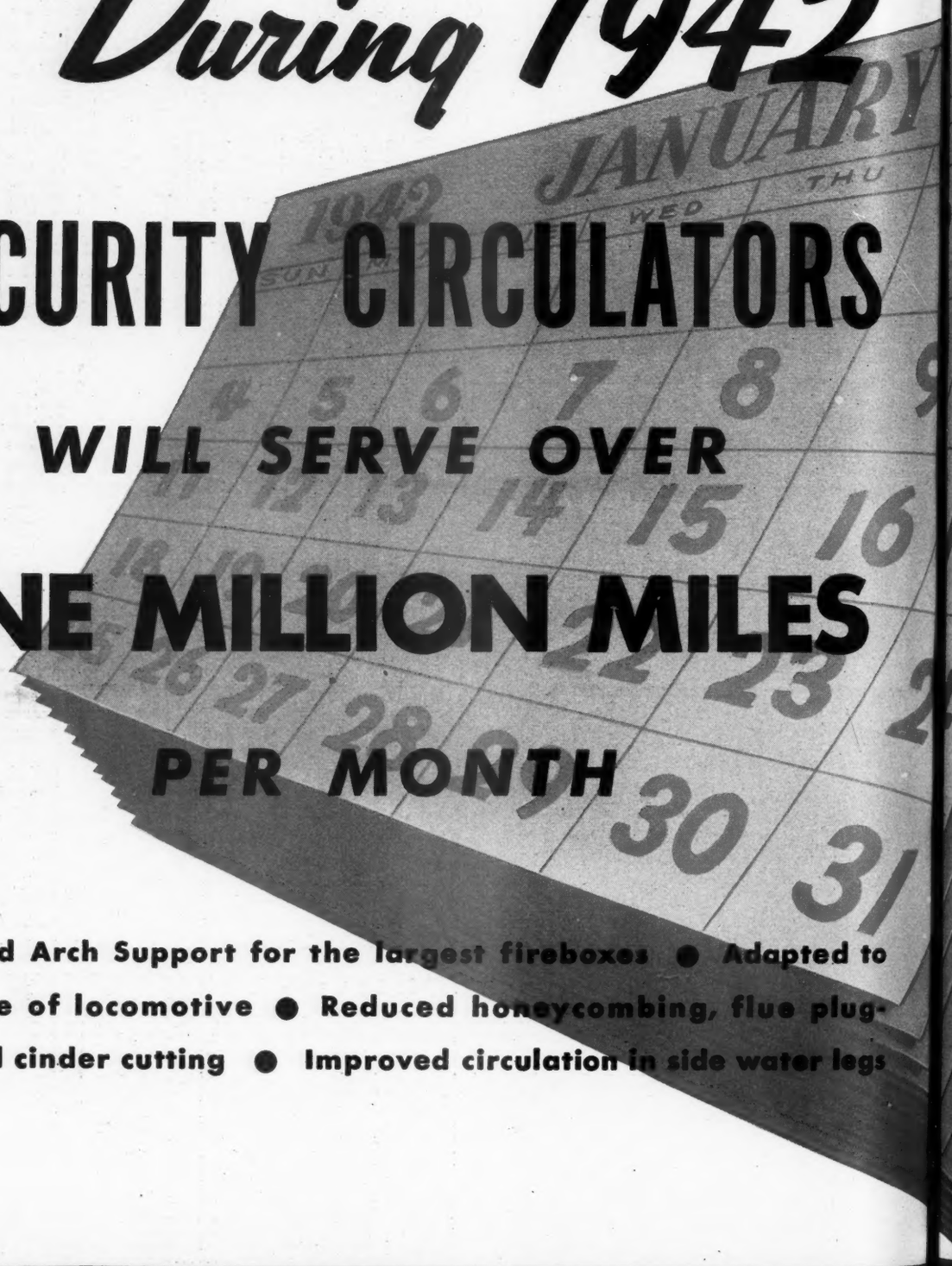
During 1942

SECURITY CIRCULATORS

WILL SERVE OVER

ONE MILLION MILES

PER MONTH



Improved Arch Support for the largest fireboxes ● Adapted to any type of locomotive ● Reduced honeycombing, flue plugging and cinder cutting ● Improved circulation in side water legs

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COMPANY, INC.

NEW YORK CHICAGO

NEWS

Would Trim Non-Defense Spending

Brookings Institution says two billion could be saved by cutting non-essentials

The joint congressional committee on the reduction of nonessential federal expenditures, of which Senator Byrd, Democrat of Virginia, is chairman, has submitted to the President and the Congress a preliminary report which recommends drastic cuts in various non-defense federal activities such as highway appropriations and waterway and flood control projects.

At the same time the Brookings Institution has released a report on the same subject which sets forth possibilities of reducing federal non-defense expenditures by more than $2,000,000,000 without trenching upon essential social services.

Specifically, the Byrd committee recommends that during the emergency one-half of the federal highway appropriations and authorizations be deferred, at a saving of $64,000,000. The committee also believes that all appropriations and authorizations for all public works, including federal dams, flood control, reclamation projects, and public buildings not directly essential to national defense, should be deferred until after the emergency. The report goes on to say that such appropriations and authorizations, including highway funds, total approximately $160,000,000.

Moreover, it is the thought of the committee that no "new adventures or commitments in public works or costly government programs" should be undertaken during the period of the war emergency except those imperatively necessary to national defense.

The Brookings study, which was conducted by Henry P. Seidemann, suggests that flood control, rivers and harbors, and other water projects could be cut by $350,000,000 and highway development by $171,000,000. The report also points out that in addition to expenditures for 1942 for which definite appropriations have been made, a rivers and harbors bill is pending in Congress which would authorize construction of non-defense public works costing nearly $1,000,000,000.

"The government," declares the Brookings study, "can set an example for the people in this critical hour by practicing the rigid economies which the national situation imperatively requires. Although nonessential private construction which is already underway is being abandoned so that men and materials will be available for the war effort, much federal non-defense construction is still proceeding. Government expenditures for non-essential activities should not be permitted to compete with the government's war program any more than private expenditures for non-essential purposes should be allowed to do so."

"To carry out a systematic program of retrenchment in non-defense expenditures so as to obtain maximum reductions with minimum disturbances to economic life will require continuous scrutiny by the Congress. To this end, it is recommended that a permanent bi-partisan committee of the Senate and House be vested with continuing responsibility for analyzing expenditures—for both non-defense and war purposes—with a view to achieving all possible economies consistent with present national objectives."

Washington Traffic Club Cancels Annual Dinner

Due to present conditions, the board of governors of the Traffic Club of Washington, D. C., has canceled that group's annual dinner which had been previously announced for the evening of February 5, at the Mayflower Hotel.

Chicago Traffic Club Cancels Dinner

The Traffic Club of Chicago has cancelled its thirty-fifth annual dinner scheduled for January 15, "in fulfillment of its patriotic duty and in the interest of exerting its entire effort to the job of production and transportation in the existing critical war situation."

A New Fleet of "400's"

A new fleet of "400" streamliners, with names appropriate to the territory served in Wisconsin and Minnesota, will be placed in operation by the Chicago & North Western on January 12. All trains in the fleet, with the exception of the Minnesota "400" which will have a streamlined steam locomotive, will be drawn by Diesel-electric locomotives, and each train will consist of a combination baggage-mail-tap room car, coaches, a dining car and parlor car—all of which are duplicates in appearance and construction of the twin cities "400."

Although only four sets of equipment are involved, the operating schedule of each has been so arranged that each will be operated in turn-around service during 16 hours of each day, and the four trains will make a total of 15 trips. The point to be served include Chicago, Milwaukee, Madison, Janesville, Beloit, Greenbay, Sheboygan, Manitowoc, Fond Du Lac, Menominee and Ishpeming.

Pelley Cites 1941 Service Records

Year-end statement tells how roads handled greatest tonnage in history

"Railroads of the United States in 1941 handled, without congestion or car shortage, the greatest volume of freight in their history, and they are confident of their ability to meet transportation demands in 1942 if materials for adequate maintenance and for new construction are made available," said J. J. Pelley, president of the Association of American Railroads in a year-end statement issued December 30.

The remainder of Mr. Pelley's statement follows:

"Despite unprecedented conditions, and the quickening effect of a growing defense and war production, traffic this year has moved smoothly and without delay. The railroads have performed an operating job of which they can well be proud. Measured in revenue ton-miles, the freight volume transported in 1941 amounted to approximately 470 billion ton-miles. This was an increase of 5.1 per cent above the previous record made in 1929. It also was an increase of 25.9 per cent above 1940. This record traffic took place despite the fact that carloadings of revenue freight were 20 per cent less than in 1929 and was due to a combination of heavier loading per car and longer haul per ton than in previous years. In 1941, freight loadings totaled 42,250,000 cars, an increase of 5,892,000 cars or 16.2 per cent above 1940.

"This volume of freight traffic was handled, however, with an ownership of nearly 600,000 fewer cars, or 26 per cent, than in 1929. It was accomplished because of a continuous improvement in cars, locomotives, and facilities, and in operating methods and efficiency, that started 20 years ago and has kept growing despite the ups and downs of the railroads in more recent years. The result has been that the railroads in 1941 hauled more freight per train than ever before and moved each train over the road nearly 1½ times as fast compared with 20 years ago.

"Although the railroads have handled this year more freight traffic and almost as great a passenger traffic as in 1929, they received for that service nearly a billion dollars less in gross earnings. This has been due to the fact that both freight and passenger rates are now much lower than they were twelve years ago.

"Among the outstanding efficiency records established by the railroads in the past

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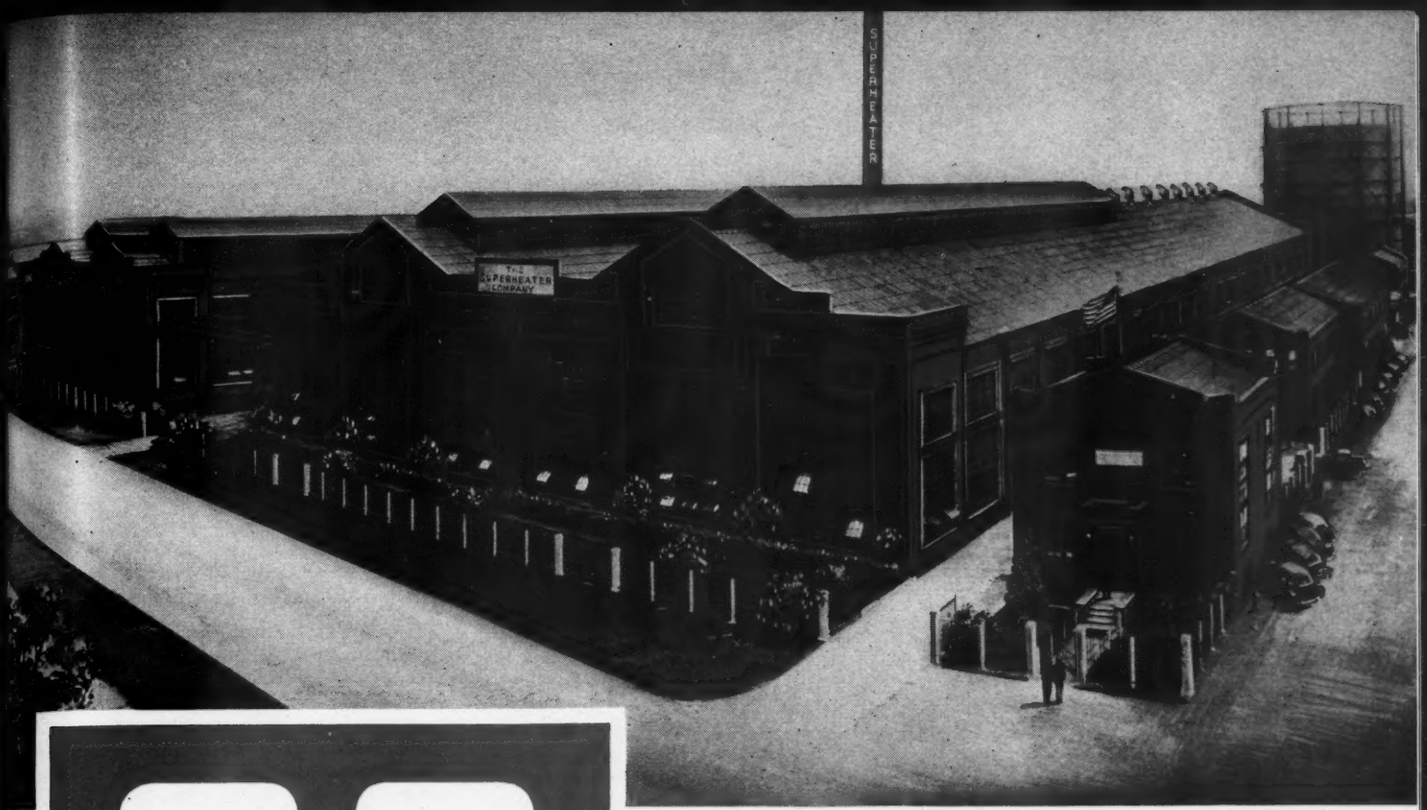

The plant of The Superheater Company at East Chicago, Indiana, which specializes in the manufacture of locomotive heat transfer equipment.

30 Years

DESIGNING *and* DEVELOPING SUPERHEATERS

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year were the following, based on returns for the first ten months:

"1. Average load of freight per train was 915 tons, a new all-time high and an increase of 40.6 per cent above that for 1921.

"2. Performance per train hour more than doubled, gross ton-miles per freight train hour having increased from 16,555 in 1921 to 34,814 in 1941, while net ton-miles per freight train hour increased from 7,506 in 1921 to 14,977 in 1941.

"3. For each pound of fuel used in freight service in 1941, railroads hauled 9.2 tons of freight and equipment one mile compared with 6.2 tons in 1921.

"4. Average daily movement of locomotives was greater in 1941 than in any preceding year.

"5. Average daily movement of freight cars established a new high record and exceeded 20 years ago by 45 per cent.

"6. Capacity per freight car averaged 50.4 tons, the greatest ever attained and an increase of 18.6 per cent compared with 1921.

"7. Tractive power of locomotives averaged 51,495 lbs, an increase of 39.4 per cent compared with twenty years ago.

"Passenger traffic in 1941 was greater than in any year since 1929, it having amounted to 29 billion passenger miles, an increase of 22.1 per cent above 1940. This increase above last year was due in part to troop movements, the railroads having handled approximately three million troops during the year. The average revenue for carrying a passenger one mile during the past year was the lowest on record, amounting to 1.75 cents compared with 3.09 cents in 1921.

"Railroads in 1941 installed about 80,000 new freight cars and about 600 new locomotives in service. They will enter the new year with approximately 75,000 new freight cars and 600 new locomotives on order with deliveries being constantly made. At the same time, both the number and percentage of freight cars now in need of repairs are less than ever before.

"In order to furnish defense officials with information as to the extent to which car and locomotive building plants will be required to take care of the railroads' needs in the coming year, the rail lines, through the Association of American Railroads, in December resurveyed their equipment needs for the coming year. As a result it has been determined that orders will be placed for the construction, in the year extending from October 1, 1941 to October 1, 1942, including those on order on the previous date 115,000 new freight cars and 974 new locomotives, including steam, electric and Diesel-electric. In the opinion of railroad executives after a careful study of the general situation and railway performance in the past, this will increase their available motive power and car supply sufficiently to enable the rail lines to handle at least a 10 per cent increase in traffic compared with 1941.

"Stimulation in traffic during the past year has improved somewhat the financial position of the railroads. Whether this will continue to be true in the coming years remains uncertain owing to rising costs of operation resulting in part from the recent mediation award by which employees were given an increase in wage rates, together with vacations with pay to certain classes of employees, at a total cost to the railroads of about $331,771,000 annually. The railroads have asked the Interstate Commerce Commission for authority to increase freight and passenger rates. Hearings in the matter are scheduled to begin on January 5, 1942.

"While complete reports are not yet available, Class I railroads in 1941 are expected to have a net railway operating income before fixed charges of approximately $980,000,000, or a return of 3.72 per cent on their property investment. For the first time since 1930, a period of 11 years, this rate of return exceeded three per cent. During the ten intervening years, 1931 to 1940, the rate ranged from a low of 1.24 per cent in 1932 to a high of 2.59 per cent in 1940. In 1940, their net railway operating income was $682,000,000. After fixed charges, the Class I railroads, according to preliminary estimates, will have a net income in 1941 of $485,000,000, compared with $189,000,000 in 1940. Gross revenues in 1941 approximated $5,325,000,000, an increase of 23.9 per cent above 1940, but a decrease of 15.2 per cent below 1929. Operating expenses were approximately $3,660,000,000 in 1941, an increase of 18.5 per cent above the preceding year but a decrease of 18.8 per cent below the 1929 figure.

"Taxes in 1941 were the highest for any year on record, amounting to $550,000,000 or a daily average of $1,507,000. The previous record for taxes was in 1929, when they amounted to $396,700,000. In 1940, they were $396,394,774. Maintenance expenditures of Class I railroads in 1941 totaled $1,590,000,000 compared with $1,316,000,000 in 1940. Of the total in 1941, expenditures for maintenance of equipment amounted to $990,000,000 and $600,000,000 for maintenance of way and structures. Expenditures for fuel, supplies and materials used in current operation by the Class I railroads amounted to approximately $1,075,000,000 in 1941, compared with $854,463,000 in 1940. Capital expenditures in 1941 for equipment, roadway and structures and other improvements to property are estimated at $600,000,000 compared with $429,147,000 in the preceding year.

"Increased traffic as well as larger expenditures for maintenance work resulted in a further increase in employment on the railroads in 1941, the average number of employees having been 1,140,000, or an increase of 11 per cent compared with the preceding year. Average annual earnings per employee in 1941 was $2,018 compared with $1,913 in 1940.

"Loans made to the railroads by the government through the Reconstruction Finance Corporation and outstanding on October 31, 1941, amounted to $443,444,000. Of loans totaling $811,325,000 so far disbursed by that agency, the railroads have repaid $367,881,000. Loans made by the Reconstruction Finance Corporation to the railroads in the first 10 months of 1941, totaled $24,720,370.

"The railroads in those ten months this year made repayments amounting to $50,480,472."

Puerto Rico Transportation Wage Committee

A committee to recommend a minimum wage in the railroad and property motor carrier industry in Puerto Rico will hold a public hearing January 8 at San Juan, Puerto Rico. Arthur F. Raper of Greensboro, Ga., is chairman of the six-member committee which was appointed on December 9 by the Administrator of the Wage and Hour Division, U. S. Department of Labor.

Rogers to Grant Temporary Motor Carrier Permits

The work, business, and functions of granting temporary operating authority to common or contract carriers by motor vehicle under section 210 (a) of the Interstate Commerce Act have been assigned to Commissioner John L. Rogers as an individual commissioner in addition to the assignment of authority under this section to Division 5 of the commission in its order of November 15, 1940, according to an announcement by I. C. C. Secretary Bartel.

P. R. R. Moves Philadelphia Offices

All departments of the Eastern region, Pennsylvania, headquartered at Philadelphia, Pa., were expected to be moved into new office quarters in Pennsylvania station at 30th street by January 3. Shortly after the first of the year, therefore, the office portion of old Broad street station, which has been used by railroad forces since 1894, will be vacated. Trains will continue to operate to and from the station as heretofore and already much of the first and second floors of the building are being occupied by the offices of Civilian Defense and city defense organizations.

10 Months Air Traffic

Domestic air lines carried 37.16 per cent more revenue passengers and handled 51.69 per cent more pounds of express during the first 10 months of this year than in the corresponding period of 1940, according to data published by the Civil Aeronautics Administration.

The increase in revenue passengers carried was from 2,324,614 to 3,188,431; while express poundage was up from 9,977,300 lb. to 15,134,792 lb. Meanwhile the increases in revenue passenger-miles flown and express pound-miles flown were, respectively, 30.29 per cent and 47.02 per cent.

Atlantic Shippers to Meet January 7

The Atlantic States Shippers Advisory Board will hold its 18th annual and 57th regular meeting at the Robert Treat hotel, Newark, N. J., on January 7 and 8. The tentative docket for the main meeting on January 8 includes a resume of the "bottom" situation for export shipments and a report on less-carload transportation. At an "old timers'" luncheon on this day, sponsored by various shipper and business groups in Newark, W. J. Williamson, general traffic manager, Sears, Roebuck &

Co., will talk on the subject "The Present Trends of Transportation." A special open meeting of the freight loss and damage prevention committee will be held at 8 p. m. on the preceding day.

New Offices for I. C. C. Bureau of Water Carriers

The Interstate Commerce Commission has appointed three district supervisors for its Bureau of Water Carriers, "with a view to establishing closer contact with water transportation on the Pacific coast, Great Lakes, Mississippi Valley system, and Gulf coast." The offices will be located in San Francisco, Calif., Chicago, and New Orleans, La.

Harold B. Anderson, formerly of the commission's Bureau of Accounts, has been appointed district supervisor at San Francisco; R. C. Thuman, formerly of the staff of the chief of engineers, United States Army, has been appointed district supervisor at Chicago; and Andrew G. Patterson, of the staff of the Bureau of Water Carriers, has been appointed district supervisor at New Orleans. The three offices are expected to be opened this month, the Commission's announcement said.

11 Months Net Income Was $439 Million

Class I railroads in the first 11 months of this year had an estimated net income after interest and rentals, of $439,983,723, as compared with $138,517,515 in the corresponding period last year, according to the Bureau of Railway Economics of the Association of American Railroads. The 11-months net railway operating income, before interest and rentals, amounted to $916,788,525, a 3.74 per cent return, as compared with $603,692,473, or 2.49 per cent, in 1940, and $820,214,052, or 3.38 per cent, in 1930.

The November net income was $30,064,315 compared with $30,809,337 in November, 1940; while net railway operating income for that month was $68,764,844, a 3.18 per cent return, compared with $71,560,226, or 3.34 per cent, in the same month of 1940, and $61,175,416, or 2.88 per cent, in November, 1930.

Would Have Commission Use New Through-Routes Powers

Finding authority for such action in the Transportation Act of 1940's so-called through - routes provisions, Examiner Charles W. Berry has recommended in a proposed report that the Interstate Commerce Commission prescribe through routes from Chicago, St. Louis, Mo., East St. Louis, Ill., and Cairo, and origins in Central territory, via Hagerstown, Md., to destinations on the Pennsylvania east of York, Pa., and Fulton Junction (Baltimore), Md., and between New York and Cape Charles, Va. The proceeding is docketed as No. 28647, the complainant, D. A. Stickwell & Sons, Inc., being a Hagerstown manufacturer of livestock and poultry feed.

In a previous case involving the same situation, the commission in 1929 found that it did not have the power to establish the routes sought; that finding came after the Supreme Court's decision in the Subiaco Routing Case (278 U. S. 269). In making his present recommendation, however, the examiner cites the 1940 amendment which stipulates among other things that the commission may prescribe through routes where they are "needed in order to provide adequate and more efficient or adequate and more economic transportation." He would interpret that exception to participating carriers' rights to their long haul as meaning service more efficient and more economic from the standpoint of the shipping public.

Representation of Employees

Results of recent elections in representation-of-employees cases have been announced by the National Mediation Board.

On the Kansas City Southern, the Arkansas Western, and the Ft. Smith & Van Buren the board has certified that the Brotherhood of Maintenance of Way Employees is now the duly designated representative of the entire craft or class of maintenance of way employees.

On the Pittsburg, Shawmut & Northern the machinists, boilermakers, blacksmiths, sheet metal workers, electrical workers, carmen, and their helpers and apprentices have chosen the Utility Workers Organizing Committee, C. I. O. as their representative; while the maintenance of way employees have designated the Brotherhood of Maintenance of Way Employees as their representative.

In an election held on the Berlin Mills the Brotherhood of Maintenance of Way Employees won the right to represent the maintenance of way employees; while on the Fairport, Painesville & Eastern the United Mine Workers of America, C. I. O. was chosen as the bargaining agent for the maintenance of way employees and the yardmasters.

As a result of voting, the American Train Dispatchers Association will hereafter represent the train dispatchers on the Burlington-Rock Island. In an election on the Toledo, Peoria & Western the maintenance of way employees voted overwhelmingly in favor of the Brotherhood of Maintenance of Way Employees; and on the Waterloo, Cedar Falls & Northern that organization will also represent the maintenance of way employees.

30% of Copper in Locomotives and Cars Can Be Eliminated

At least 30 per cent of the copper used in locomotives and cars can be eliminated, according to reports made by manufacturers to a special committee on locomotive and car construction of the Mechanical Division of the Association of American Railroads at Chicago on December 29. The meeting followed a similar one on December 16 at which substitutions for copper were discussed. These discussions of the use of substitutes for copper are a result of Conservation order No. M-9-C-issued by the Priorities division of the OPM which calls for a reduction of about 30 per cent in the use of copper.

The special committee of the Mechanical division will consolidate the reports of the manufacturers and submit the consolidation and its own recommendations to the OPM. It is expected that the OPM will later issue specific instructions as to the use of copper in locomotives and cars.

Railroads Observe the Holiday Customs

Railroad station singing is growing in popularity. In at least three large eastern terminals commuters and casual travelers responded to the opportunity to make the rafters ring in pre-entraining carol "sings." More than 1,000 persons joined daily in carroling in the main concourse of Grand Central Terminal, New York, preceding and following brief concerts by prominent

Boston & Maine Commuters Sang Carols Each Evening from 5 to 5:30 in North Station

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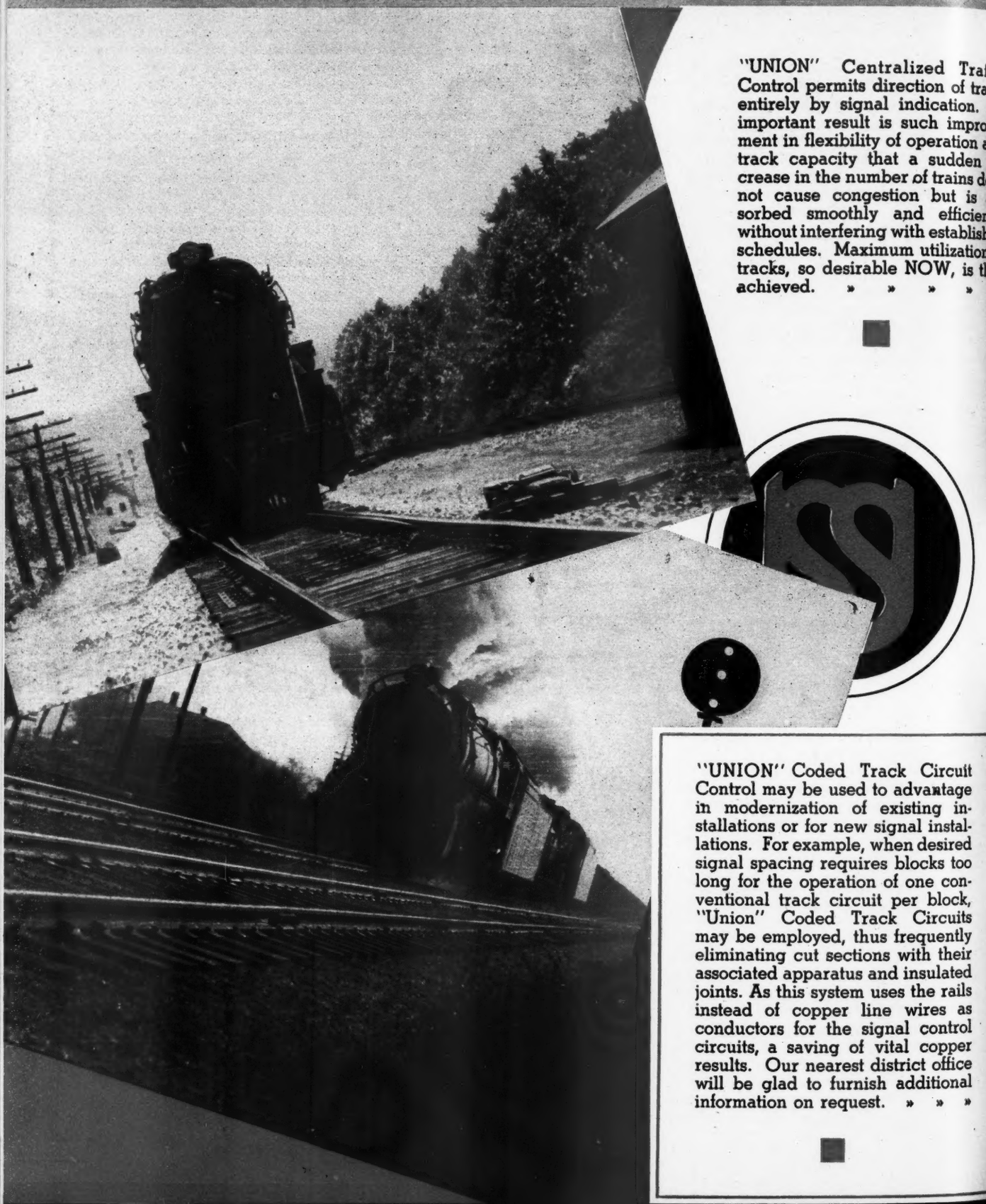
SIGNAL SYSTEMS PROVIDE
with Minimum



"UNION" Centralized Traffic Control permits direction of trains entirely by signal indication. An important result is such improvement in flexibility of operation and track capacity that a sudden increase in the number of trains does not cause congestion but is absorbed smoothly and efficiently without interfering with established schedules. Maximum utilization of tracks, so desirable NOW, is thus achieved. » » » » »

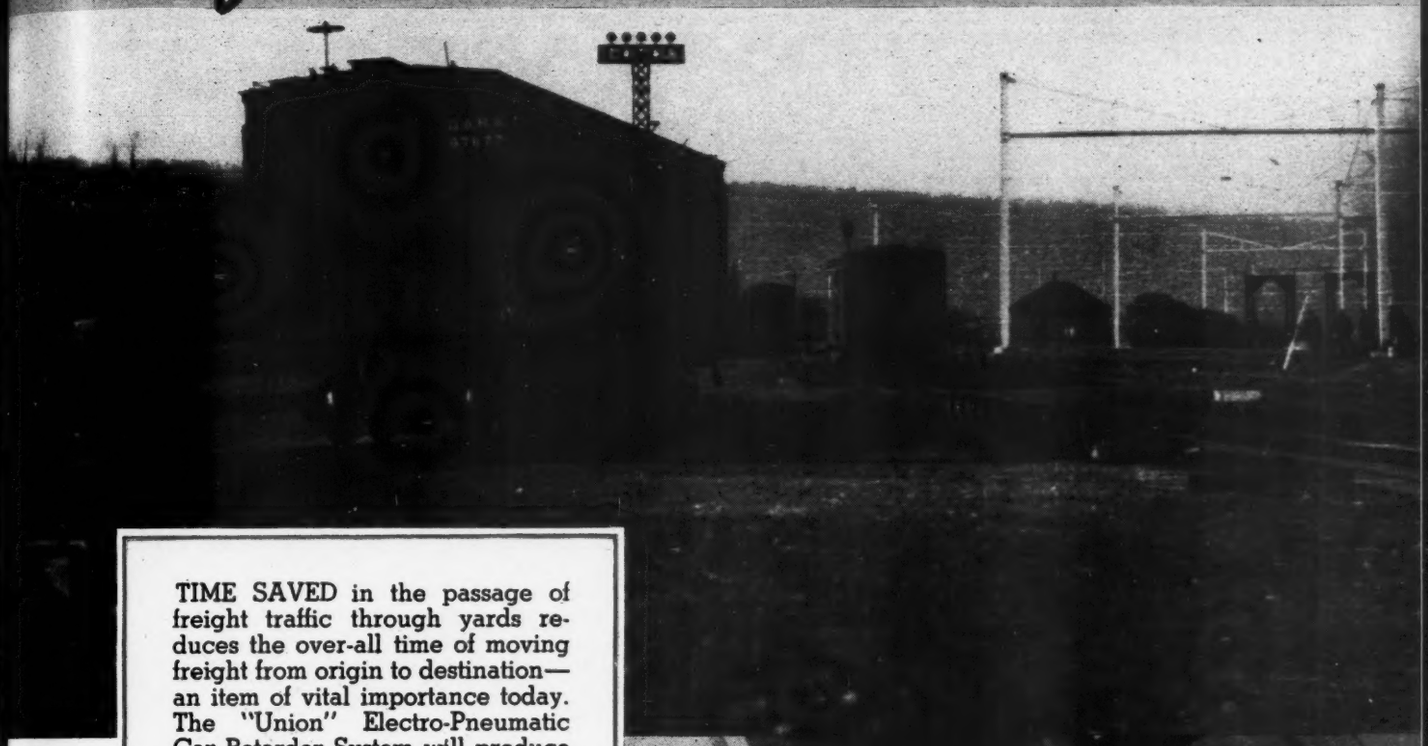
"UNION" Coded Track Circuit Control may be used to advantage in modernization of existing installations or for new signal installations. For example, when desired signal spacing requires blocks too long for the operation of one conventional track circuit per block, "Union" Coded Track Circuits may be employed, thus frequently eliminating cut sections with their associated apparatus and insulated joints. As this system uses the rails instead of copper line wires as conductors for the signal control circuits, a saving of vital copper results. Our nearest district office will be glad to furnish additional information on request. » » »

UNION SWITCH & SIGNAL COMPANY

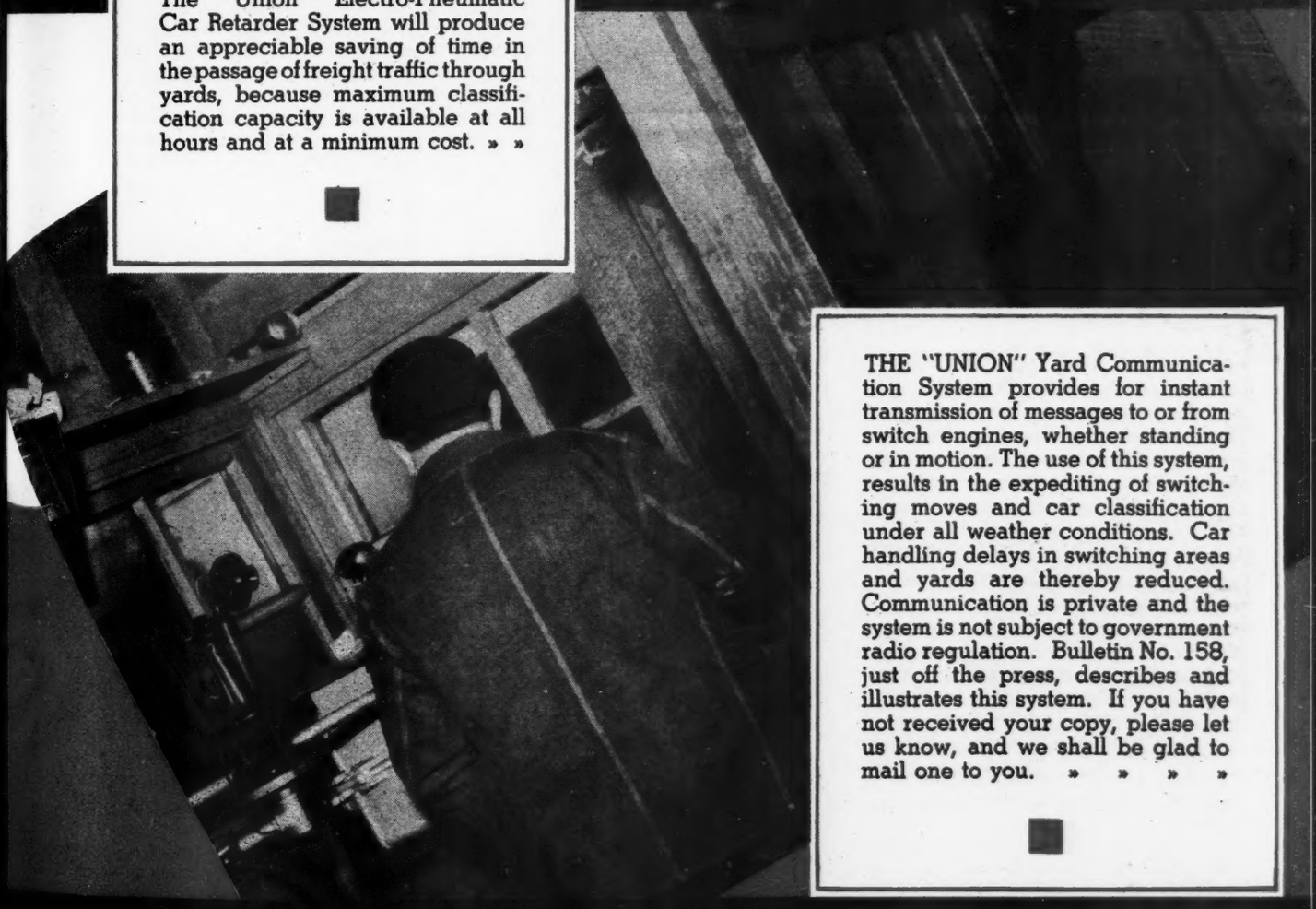
NEW YORK CHICAGO ST. LOUIS

MAXIMUM USE OF TRACKS

use of Metals



TIME SAVED in the passage of freight traffic through yards reduces the over-all time of moving freight from origin to destination—an item of vital importance today. The "Union" Electro-Pneumatic Car Retarder System will produce an appreciable saving of time in the passage of freight traffic through yards, because maximum classification capacity is available at all hours and at a minimum cost. » »



THE "UNION" Yard Communication System provides for instant transmission of messages to or from switch engines, whether standing or in motion. The use of this system, results in the expediting of switching moves and car classification under all weather conditions. Car handling delays in switching areas and yards are thereby reduced. Communication is private and the system is not subject to government radio regulation. Bulletin No. 158, just off the press, describes and illustrates this system. If you have not received your copy, please let us know, and we shall be glad to mail one to you. » » » »

SWISSVALE, PA.

SAN FRANCISCO

organized choirs. The commuters were led in singing by the "railway station troubadour."

Concerts were again held by a trained women's chorus in the vaulted main room of Pennsylvania station, as in previous years, following which station travelers were invited to join in the better-known numbers. For the fourth consecutive year, Boston & Maine commuters paused in North station, Boston, Mass., on their way home to join in the songs of Christmas time under the direction of "the singing cop," while each morning they were privileged to hear 45 minutes of organ music. On club cars throughout the land, informal parties made Christmas on wheels an improvement on, rather than a deprivation of, the home holiday customs. The Seaboard Air Line, for example, had a Santa on board its "Silver Meteor," and the Baltimore & Ohio had trees on practically all through trains.

Accounts for Water Carriers

The Interstate Commerce Commission has prescribed, effective January 1, 1942, a uniformed system of accounts for use by water carriers subject to Part III of the Interstate Commerce Act which have annual operating revenues exceeding $100,000. This comprehensive set-up supersedes accounting regulations in effect since 1912 for such water lines as were subject to the commission's jurisdiction prior to enactment of the Transportation Act of 1940, which placed the regulation of all domestic water transportation under the I. C. C.

The new system is set out in a document of 178 mimeographed sheets. It prescribes all classes of accounts, including depreciation accounting. In the latter connection the classes of depreciable equipment include line equipment, harbor equipment, miscellaneous floating equipment, buildings and other structures, office and other terminal equipment, motor and other highway vehicles.

Enginemen and Trainmen on T. P. & W. Walk Out

Enginemen and trainmen of the Toledo, Peoria & Western walked out on December 28 thereby entirely paralyzing the 239-mile railroad. The strike was called by the Brotherhood of Locomotive Firemen and Enginemen and the Brotherhood of Railroad Trainmen following the company's announcement that it would put new rates of pay, rules and working conditions in effect on December 29. As reported in the *Railway Age* of December 27, these matters have been in controversy for several months. According to the railroad, a number of employees were in favor of giving the company's proposals a trial. The unions contend that the contract proposed by the company does not recognize seniority as the sole basis in the assignment of runs and reduces wages by altering the basis of wage calculations.

On December 29, the railroad notified all employees represented by the two brotherhoods involved that failure to report for work on December 30 would be construed as an indication that the employee does not desire to continue in the employ of the railroad. At the same time the company began to hire new employees. In a wire to the Mediation Board on December 28, the railroad again requested the appointment of an Emergency Board. The Mediation Board's reply of the same day urged the railroad to arbitrate and stated that the employees at the Board's request had changed their position and are willing to arbitrate.

Freight Car Loading

Car loading figures for the week ended December 27 were not available at the time this issue went to press.

Loadings of revenue freight for the week ended December 20, totaled 798,697 cars, the Association of American Railroads announced on December 27. This was a decrease of 8,528 cars or 1.1 per cent below the preceding week, but an increase of 100,942 cars or 14.5 per cent, above the corresponding week in 1940, and an increase of 147,305 cars or 22.6 per cent above the comparable week in 1939.

The summary for that week, compiled by the Car Service Division, A. A. R. follows:

Revenue Freight Car Loading

For Week Ended Saturday, December 20

Districts	1941	1940	1939
Eastern	168,713	156,259	147,514
Allegheny	174,312	154,379	140,882
Pocahontas	52,294	44,417	43,886
Southern	125,440	109,010	99,360
Northwestern ..	96,815	81,434	74,571
Central Western	119,658	103,884	97,928
Southwestern ..	61,465	48,372	47,251
Total Western Districts	277,938	233,690	219,750
Total All Roads	798,697	697,755	651,392
Commodities			
Grain and grain products	41,423	27,933	32,702
Live stock	14,528	12,032	11,416
Coal	156,264	148,580	138,736
Coke	13,996	12,686	12,083
Forest products.	43,135	37,454	31,711
Ore	13,638	13,046	11,811
Merchandise l.c.l.	150.038	148,953	144,518
Miscellaneous ..	365,675	297,071	268,415
December 20 ..	798,697	697,755	651,392
December 13 ..	807,225	736,340	678,132
December 6 ...	833,375	738,513	683,973
November 29 ..	866,189	728,525	685,496
November 22 ..	799,386	733,488	673,113
Cumulative Total, 51 Weeks ...	41,678,401	35,812,547	33,363,434

In Canada.—Carloadings for the week ended December 20 totaled 57,278, as compared with 62,886 in the previous week and 57,528 in the corresponding week last year, according to the summary of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
Dec. 20, 1941	57,278	31,661
Dec. 13, 1941	62,886	31,953
Dec. 6, 1941	66,666	32,402
Dec. 21, 1940	57,528	28,952
Cumulative Totals for Canada:		
Dec. 20, 1941	3,139,934	1,532,222
Dec. 21, 1940	2,772,239	1,273,777
Dec. 23, 1939	2,512,583	1,108,850

P. & W. V. Sued for Coal Company Losses

The Pittsburgh & West Virginia is named among a group of coal and miscellaneous companies of the so-called Taplin group as defendant in a suit filed in the federal district court at Pittsburgh, Pa., on December 29 by W. G. Heiner, trustee of the Pittsburgh Terminal Coal Corporation. Counsel for the complainant charged that the defendants entered into a conspiracy to gain control of Pittsburgh Terminal and between 1923 and 1938 "exploited, despoiled, injured and defrauded" the company and its stockholders. Specifically, the charge was made that in order to feed traffic to the P. & W. V. and coal to Taplin-owned retail sales outlets, the mines of Pittsburgh Terminal were continued in "wasteful and inefficient" operation. Pennroad Corporation which purchased control of the P. & W. V. in 1929 is also named a defendant and charged with collusion with Mr. Taplin in operation of the road following purchase.

N. Y. C. Gets More Time to Divorce Boat Line

The Interstate Commerce Commission has extended until 90 days beyond January 2, 1942, the time given the New York Central to divest itself voluntarily of that interest in the Nicholson Universal Steamship Company, a Great Lakes operator, which the commission has found to be in violation of the so-called Panama-Canal-Act provisions of the Interstate Commerce Act. The commission's report in the proceeding, which is docketed as No. 28162, was reviewed in the *Railway Age* of November 8, page 753.

The present order extends the effective date of that report from October 6, 1941, until January 2, 1942, and stipulates that the 90 days within which the Central is expected to act voluntarily shall be computed from the latter date. The N. Y. C.-Nicholson tie-up came about by reason of the relationship of N. Y. C. affiliates to the United States Freight Company, parent corporation of the Universal Carloading & Distributing Company.

November Truck Tonnage 7.6 Per Cent Above 1940

The volume of revenue freight transported by motor truck in November dropped 14 per cent under the October tonnage, but increased 7.6 per cent over November, 1940, according to American Trucking Associations.

Comparable reports were received from 205 motor carriers in 38 states. The reporting carriers transported an aggregate of 1,202,991 tons in November, as against 1,398,321 tons in October, and 1,118,496 tons in November, 1940. The A. T. A. index figure, based on the average monthly tonnage of the reporting carriers for the 1938-1940 period as 100, was 147.78 for November, as compared with October's 172.37.

Almost 75 per cent of all tonnage transported in the month was reported by carriers of general freight. The volume in this category decreased 15 per cent under October, and increased 10.9 per cent over November of the previous year. Transporters of petroleum products, accounting for a little more than eight per cent of the total tonnage reported, showed a decrease of 5.2 per cent under October, but held 11.8 per cent over November of last year. Movement of new automobiles and trucks constituted a little more than six per cent of the total; tonnage in this class showed a slight decline of 0.3 per cent under Oc-

Continued on next left-hand page

INCREASE NET REVENUES

LOCOMOTIVES equipped with Wear-resisting Parts made from HUNT-SPILLER *Air Furnace* GUN IRON spend most of their time out on the road producing revenues.

When they arrive at a roundhouse after a trip — it's merely a case of servicing, inspection and, insofar as H S G I parts are concerned, they are ready for the dispatchers call.

Make provisions for greater earnings from your locomotives this year. Apply H S G I parts on all your power and take advantage of the savings in fuel, materials and maintenance, which this special material offers.

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tober, and a decrease of 20 per cent under November, 1940. Haulers of iron and steel products reported almost five per cent of the total tonnage. The volume of these commodities decreased 22.5 per cent under October and 5.6 per cent under November of last year. A little more than six per cent of the total tonnage reported was miscellaneous commodities, including tobacco, milk textile products, bricks, building materials, cement and household goods. Tonnage in this class decreased 15.6 per cent under October, but held 12.1 per cent over November, 1940.

Club Meetings

The New England Railroad Club will hold its next meeting on January 13 at the Hotel Touraine, Boston, Mass., at 6:30 p. m. Professor Kent T. Healy, Yale University, will present a paper entitled "Railroad Policy of the Present Emergency."

The annual dinner of the Transportation Club of the Rochester (N. Y.) Chamber of Commerce, usually held in February, has been cancelled following action taken by the Executive committee on December 18, "in order to give everyone full opportunity to concentrate on national defense demands."

The Canadian Industrial Traffic League will hold its 20th annual convention at the Windsor hotel, Montreal, Que., Canada, on February 3 and 4, the annual dinner being on the latter date.

The Women's Traffic Club of Greater New York will hold its next meeting at the Park Central hotel on January 13 at 6:30 p. m. Roy B. White, president of the Baltimore & Ohio, will be the guest speaker.

Boston, Mass., Commercial Zone

The Interstate Commerce Commission, Division 5, has determined the zone adjacent to and commercially a part of Boston, Mass., and continuous municipalities, in which transportation by motor vehicle, in interstate and foreign commerce, not under continuous carriage or shipment to or from a point beyond the zone, is exempt from regulation except as to qualifications and maximum hours of service of employees and safety of operation or standards of equipment. The same report finds that the removal of such partial exemption in the Boston zone is not necessary to carry out the national transportation policy.

In the latter connection the motor carriers had asked the complete removal of the exemption to prevent "unfair and competitive practices" among themselves. Shipper interests opposed such removal. The Boston commercial zone defined in the report included the municipalities of Boston, Chelsea, Revere, Everett, Malden, Somerville, Medford, Cambridge, Newton, and Quincy, and the area within the township limits of Winthrop, Watertown, Needham, Dedham, Brookline, and Milton.

Common Carrier Trucks May Still Get Tires

New tires may still be obtained for trucks operated in connection with highway services of the Railway Express Agency and the railroads under the rationing plan which becomes effective January 5. The list of vehicles which under the plan may be equipped with new rubber tires, casings, or tubes includes trucks operated exclusively in "transportation by any common carrier." Also eligible are buses of 10 or more passengers capacity operated as "part of the services rendered to the public by a regular transportation system."

The rationing plan was announced on December 27 by Leon Henderson, administrator of the Office of Price Administration. Generally, the OPA announcement described the list of eligibles as one "designed to insure continuance of operation of vehicles required for the public health and safety, vehicles with a capacity of ten or more passengers required for transportation purposes, and for essential truck operations."

Those on the eligible list seeking to buy new tires will have to fill out application forms. The applicant will then have to get this approved by an inspector. Inspectors will be dealers or garagemen accredited by the local rationing boards.

Maloney Committee Reports on Oil Situation

The special Senate committee which has been investigating the alleged petroleum shortage on the east coast has submitted a report, including its preliminary findings, to the Senate. The preliminary report stated that the committee had found no shortage of petroleum and its products at the time of its hearings in August and September. The committee pointed out in a letter accompanying the reports, however, that the exigencies of war might materially change the situation in the future, although reports to the petroleum coordinator indicated that reserves of petroleum in the Atlantic coast area were at a comfortable level.

"The committee has kept a check on all means of transportation in an effort to anticipate any possible carrier shortage," declared the report of the committee, which was headed by Senator Maloney, Democrat of Connecticut. "Recent information has been collected from railway tank car owners, and users, on the capacity and use of their tank car equipment. This information furnishes a base for estimating additional potential service that may be rendered in meeting future petroleum transportation problems on the railways. The tank-ship delivery schedule is encouraging and efficiencies have increased in pipe line movements."

First-Quarter Loadings Expected to Be 8.1 Per Cent Above 1941

Freight carloadings in the first quarter of 1942 are expected to be 8.1 per cent above actual loadings in the same quarter in 1941, according to estimates compiled by the 13 Shippers' Advisory Boards. On the basis of those estimates, freight carloadings of the 28 principal commodities will be 6,054,328 in the first quarter of 1942 compared with 5,601,422 for the same commodities in the corresponding period in 1941. All of the 13 Shippers' Advisory Boards estimate an increase in carloadings for the first quarter of 1942 compared with the same period in 1941.

These estimates normally include 29 commodities, but owing to the uncertainty of the automobile industry, pending an announcement by the Office of Production Management, as to production in February and March, no estimate for the quarter as to automobiles, trucks and parts was made. For the month of January alone, loading of assembled automobiles and trucks for the entire country is estimated at 15,681 freight cars, compared with 50,513 in January last year, or a reduction of 69 per cent. The Great Lakes Shippers' Advisory Board estimates that, in that region where more automobiles are produced than in any other, carloadings of assembled automobiles and trucks in January will be 7,612 compared with 24,322 in the same month in 1941, or a reduction of 68.7 per cent. In the territory covered by the Trans-Missouri-Kansas Board, which ranks next to the Great Lakes region, estimated carloadings of assembled automobiles and trucks in January will be 2,189 compared with 7,399 in the same month in 1941, or a reduction of 70.4 per cent.

The tabulation below shows actual carloadings for each district in the first quarter of 1941, the estimated loadings for the first quarter of 1942, and the percentage of increase of the 28 principal commodities:

Shippers' Advisory Boards	Actual Loadings First Quarter 1941	Estimated Loadings First Quarter 1942	Per Cent Increase
New England...	126,442	135,325	7.0
Atlantic States..	626,813	665,693	6.2
Allegheny	977,565	1,052,239	7.6
Ohio Valley	711,994	727,279	2.1
Southeast	714,796	778,787	9.0
Great Lakes ...	267,271	294,871	10.3
Central Western.	188,366	205,865	9.3
Mid-West	806,924	883,219	9.5
Northwest	150,516	182,350	21.1
Trans-Missouri-Kansas	262,231	279,265	6.5
Southwest	357,353	418,095	17.0
Pacific Coast ..	218,874	231,299	5.7
Pacific Northwest	192,277	200,041	4.0
Total	5,601,422	6,054,328	8.1

The 13 Shippers' Advisory Boards, expect an increase in the first quarter of 1942, compared with the same period one year ago, in the loading of all of the 28 commodities except cotton seed and products, other than oil, for which a decrease of 3.1 per cent is estimated, and agricultural implements and vehicles other than automobiles, for which a decrease of 13 per cent is estimated.

Among those showing the greatest increase are the following: Grain, 26.6 per cent; gravel, sand and stone, 25.2 per cent; chemicals and explosives, 24.2 per cent; citrus fruits, 21.5 per cent; machinery and boilers, 21.1 per cent; paper, paperboard and prepared roofing, 14.4 per cent; brick and clay products, 12 per cent; cement, 11.2 per cent; hay, straw and alfalfa, 9.9 per cent; fertilizers of all kinds, 9.3 per cent; canned goods, 9.3 per cent; cotton, 9.1 per cent; ore and concentrates, 7.5 per cent; iron and steel, 7.3 per cent; petroleum and petroleum products, 7.2 per cent; and coal and coke, 6 per cent.

Emergency Rate Case Hearings Moved to St. Louis

Hearings in the railroads' and the Railway Express Agency's emergency rate increase cases, which had been assigned to Chicago on January 5 and 9 respectively,

Continued on fifth right-hand page

SANTA FE — 5400-Hp. Diesel Freight Locomotive

General Motors Diesel Freight Locomotive

A New Milestone in Transportation Progress

TRANSPORTATION history was made when Electro-Motive Corporation, subsidiary of General Motors, offered to the nation the first Diesel for main line freight service, which ranks as one of the world's most powerful locomotives. In keeping with the established policy to thoroughly preprove each new type of equipment before offering it to the railroads, Electro-Motive Corporation built a 5400-hp. Diesel locomotive for test in freight service.

For over a year this locomotive operated 83,764 miles on 20 Class I railroads in 35 states under all conditions from sub-zero weather to 115 degrees, and from sea level to 10,000 feet. It showed remarkable reliability of performance, 100 per cent availability for service, and evidenced all the operating advantages and economies for which it was designed.

So remarkable were the results of these tests that the Santa Fe immediately purchased four 5400-hp. Diesel freight locomotives, which are now in service, and has (October, 1941) sixteen more on order. The Great Northern has two 2700-hp. Diesels in freight and passenger service with more on order — the Southern Railway has two 5400-hp. Diesels and the Milwaukee Road one 5400-hp. Diesel in service. The Rio Grande, Western Pacific and Seaboard have three 5400-hp. Diesels each, on order.

This giant 5400-hp. Diesel has a starting tractive effort of 220,000 lb. and a top speed of 75 m.p.h. It carries 4800 gal. of fuel — sufficient to haul an average tonnage train 500 miles without refueling. Built in four sections, each section powered by one 16-cylinder, 2-cycle, 1350-hp. General Motors Diesel Engine, with a total weight of approximately 900,000 lb., all of which is carried on the thirty-two driving wheels, and with every pound available for traction and braking effort, it is distinctly adaptable to both freight and passenger service.

On one of its first test runs, with no attempt for speed or tonnage records, Santa Fe 5400-hp. Diesel No. 100 with a maximum of 68 cars (3,150 tons) made the entire 1761.8-mile run between Argentine, Kansas, and Los Angeles in 54 hrs. 35½ min. running time—an average speed of 32.3 m.p.h. Throughout the entire run, it showed ample reserve capacity for handling much heavier trains and at substantially higher speeds. Tremendous potential savings were indicated. At least seven steam locomotives are generally required to handle the same train on the same run with 12 stops for fuel and water and 16 additional stops for water only. The Diesel made the trip with only four stops for fuel.

The Electro-Motive Dynamic Brake Equipment, first applied to Santa Fe No. 100, makes it possible to handle heavy trains down severe grades faster, with safety, minimum braking, elimination of excessive wheel heating and reduced brake shoe wear.

GENERAL MOTORS LOCOMOTIVES

ELECTRO-MOTIVE CORPORATION, LA GRANGE, ILLINOIS, U. S. A.

SUBSIDIARY OF GENERAL MOTORS

Above: WESTERN PACIFIC RAILROAD—5400-Hp. Diesel Freight Locomotive

Below: SEABOARD RAILWAY—5400-Hp. Diesel Freight Locomotive

Above: GREAT

Above: GREAT NORTHERN RAILWAY—2700-Hp. Diesel Freight-Passenger Locomotive

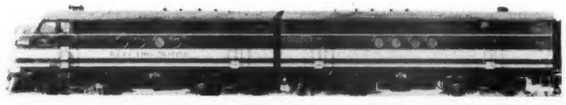
Below: DENVER & RIO GRANDE WESTERN—5400-Hp. Diesel Freight Locomotive

Above: THE MILWAUKEE ROAD—5400-Hp. Diesel Freight Locomotive

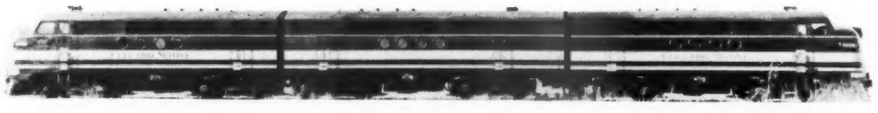
Below: SOUTHERN RAILWAY—5400-Hp. Diesel Freight Locomotive

General Motors Diesel Freight Locomotives

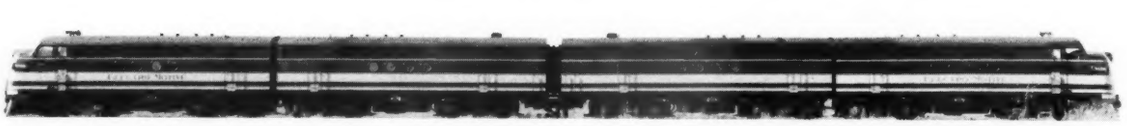
Are Contributing Many Important Advantages And Economies In Fast Revenue Service



2700-Hp.—2-Unit Locomotive



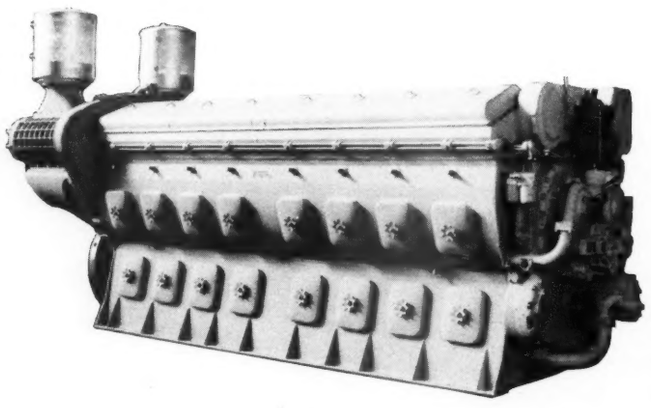
4050-Hp.—3-Unit Locomotive



5400-Hp.—4-Unit Locomotive

THE many potential advantages and economies, which were so conclusively proved by the GM experimental freight locomotive during the 12 months of test on 20 Class 1 railroads, are today being duplicated by similar locomotives in daily revenue service.

We know of no steam power available at this time which can approach the GM Diesel freight locomotive in every phase of performance . . . POWER for hauling greater tonnage and reducing or eliminating helper service on grades — SPEED for faster schedules — FLEXIBILITY for meeting traffic conditions—high AVAILABILITY with minimum time out for servicing and repairs — and additional ECONOMY in lower fuel costs, elimination of expensive supporting services required for steam power, lower track maintenance, fewer fuel and water stops which speeds up freight schedules, and smoother starts and stops resulting in greater protection of cars and lading.



1350-Hp., 16-cylinder, General Motors Diesel Engine which powers each GM freight unit

The flexibility of the 5400-hp. GM Diesel freight locomotive is a decided advantage over steam power. Where a railroad is equipped with several of these locomotives, the 1350-hp. units can be grouped to provide other unit combinations, such as 2700-hp. and 4050-hp. Thus, locomotive capacity can be economically fitted to varying traffic conditions. Such flexibility is especially advantageous when one unit is temporarily out of service, because in such cases it is no longer necessary to tie up the complete locomotive.

GM Diesel power has very definitely proved its superiority in switching, transfer, freight and passenger service. The full potential savings which follow the complete Dieselization of an entire railroad or section of railroad can now be realized. Expensive supporting services which are not required for Diesel operation, such as coal docks, water stations and water treating facilities, cinder pits, boiler washing and fire-cleaning, can be gradually reduced and finally eliminated . . . damage and repairs to rails, roadbed and bridges will be materially reduced . . . fewer locomotives will be required to meet traffic demands.

NEW TOOLS — NEW STANDARDS — NEW ECONOMIES — all for the prime purpose of improving service to shippers and the public, and building bigger profits for the railroads.

GENERAL MOTORS LOCOMOTIVES

ELECTRO-MOTIVE CORPORATION, LA GRANGE, ILLINOIS, U. S. A.

SUBSIDIARY OF GENERAL MOTORS

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have now been shifted to St. Louis, Mo., at the Hotel Statler on the same dates. In the railroad's case, which is docketed as ex parte No. 148, the carriers are seeking increased freight and passenger rates which would produce about $356,956,000 additional annual revenue to offset augmented wage costs and other increases in expenses. To meet the same increased expenses, the R. E. A. is seeking to establish an emergency surcharge of 10 cents per l.c.l. shipment of one or more packages.

The Commission's notice goes on to say that representations have been made that because of conditions growing out of the present national emergency, it is desirable that the oral argument in ex parte No. 148, originally scheduled for Washington, D. C., should be in St. Louis immediately following the hearing. That proceeding, accordingly, it continues, is set for argument before the Commission at St. Louis immediately after the close of the taking of testimony.

Persons submitting verified statements in ex parte No. 148 in response to the petitions described in the Commission's notice of December 27 are advised to address copies thereof to the persons named in that notice at the Hotel Statler in St. Louis.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

ALLIED RAILWAY SUPPLY ASSOCIATION.—J. F. Gettrust, P. O. Box 5522, Chicago, Ill.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—W. R. Curtis, G. M. & O. R. R., 105 W. Adams St., Chicago, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. P. Soebbing, 1431 Railway Exchange Bldg., St. Louis, Mo. Annual meeting, October 6-8, 1942, Omaha, Neb.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—B. D. Branch, C. R. R. of N. J., 143 Liberty St., New York, N. Y.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—F. O. Whiteman, Room 332, Dearborn Station, Chicago, Ill. Annual meeting, May 12-14, 1942, Hotel Stevens, Chicago, Ill.

AMERICAN ASSOCIATION OF RAILWAY ADVERTISING AGENTS.—E. A. Abbott, Poole Bros., Inc., 85 W. Harrison St., Chicago, Ill. Annual meeting, January 16-17, 1942, St. Louis, Mo.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger, C. I. & L. Ry., 836 S. Federal St., Chicago, Ill.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—A. G. Shaver, 310 S. Michigan Ave., Chicago, Ill. Annual meeting, October 20-22, 1942, Hotel Stevens, Chicago, Ill.

AMERICAN RAILWAY CAR INSTITUTE.—W. C. Tabbert, 19 Rector St., New York.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—H. C. Millman, Ind. Agent, Pennsylvania R. R., Union Station, Chicago, Ill.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in cooperation with the Association of American Railroads, Engineering Division.—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 17-19, 1942, Palmer House, Chicago, Ill.

AMERICAN RAILWAY MAGAZINE EDITORS' ASSOCIATION.—W. M. Jones, Baltimore & Ohio R. R., 1105 B. & O. R. R. Bldg., Baltimore, Md.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—J. H. Huntt, Tower Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—C. E. Davies, 29 W. 39th St., New York, N. Y.
Railroad Division, C. L. Combes, *Railway Age*, 30 Church St., New York, N. Y.

AMERICAN TRANSIT ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York, N. Y.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1427 Eye St. N. W., Washington, D. C. Annual meeting, January 27-29, 1942, Nicollet Hotel, Minneapolis, Minn.

ASSOCIATION OF AMERICAN RAILROADS.—H. J. Forster, Transportation Bldg., Washington, D. C.
Operations and Maintenance Department.—Charles H. Buford, Vice-President, Transportation Bldg., Washington, D. C.
Operating-Transportation Division.—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.
Operating Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.
Transportation Section.—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.
Fire Protection and Insurance Section.—W. F. Steffens, New York Central, Room 3317, 230 Park Avenue, New York, N. Y.
Freight Station Section.—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.
Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.
Protective Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.
Safety Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.
Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York, N. Y.
Engineering Division.—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 17-19, 1942, Palmer House, Chicago, Ill.
Construction and Maintenance Section.—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 17-19, 1942, Palmer House, Chicago, Ill.
Electrical Section.—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill.
Signal Section.—R. H. C. Balliet, 30 Vesey St., New York, N. Y.
Mechanical Division.—Arthur C. Browning, 59 E. Van Buren St., Chicago, Ill.
Electrical Section.—J. A. Andreucetti, 59 E. Van Buren St., Chicago, Ill.
Purchases and Stores Division.—W. J. Farrell (Executive Vice-Chairman), Transportation Bldg., Washington, D. C.
Freight Claim Division.—Lewis Pilcher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, 1942, Chicago, Ill.
Motor Transport Division.—George M. Campbell, Transportation Bldg., Washington, D. C.
Car-Service Division.—E. W. Coughlin Transportation Bldg., Washington, D. C.
Finance, Accounting, Taxation and Valuation Department.—E. H. Bunnell, Vice-President, Transportation Bldg., Washington, D. C.
Accounting Division.—E. R. Ford, Transportation Bldg., Washington, D. C.
Treasury Division.—E. R. Ford, Transportation Bldg., Washington, D. C.
Traffic Department.—A. F. Cleveland, Vice-President, Transportation Bldg., Washington, D. C.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—F. L. Johnson, Claim Agent, Alton R. R., 340 W. Harrison St., Chicago, Ill. Annual meeting, June 17-19, 1942, Hotel Statler, Buffalo, N. Y.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—P. R. Austin, Johns-Manville Sales Corp., Merchandise Mart, Chicago, Ill.

CANADIAN RAILWAY CLUB.—C. R. Crook, 4415 Marcil Ave., N. D. G., Montreal, Que. Regular meetings, second Monday of each month except June, July and August, Windsor Hotel, Montreal, Que.

CAR DEPARTMENT ASSOCIATION OF ST. LOUIS, MO.—J. J. Sheehan, 1101 Missouri Pacific Bldg., St. Louis, Mo. Regular meetings, third Tuesday of each month, except June, July and August, Hotel De Soto, St. Louis, Mo.

CAR DEPARTMENT OFFICERS' ASSOCIATION.—Frank Kartheiser, Chief Clerk, Mechanical Dept., C. B. & Q., Chicago, Ill.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, 8238 S. Campbell Ave., Chicago, Ill. Regular meetings, second Monday of each month, except June, July and August, La Salle Hotel, Chicago, Ill.

CENTRAL RAILWAY CLUB OF BUFFALO.—Mrs. M. D. Reed, 1840-42 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, second Thursday of each month, except June, July and August, Hotel Statler, Buffalo, N. Y.

EASTERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. T. Bougher, 424 W. 33rd St. (11th floor), New York, N. Y. Next meeting, March 26, 1942.

LOCOMOTIVE MAINTENANCE OFFICERS' ASSOCIATION.—C. M. Lipscomb, 1721 Parker Street, No. Little Rock, Ark.

MASTER BOILER MAKERS' ASSOCIATION.—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—Ben Smart, 7413 New Post Office Bldg., Washington, D. C. 1942 meeting, Dallas, Tex.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. H. White, Room 1826, 208 S. La Salle St., Chicago, Ill. Exhibit in connection with A. R. E. A. Convention, March 16-19, 1942, 122nd Field Artillery Armory, 234 East Chicago Ave., Chicago, Ill.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, second Tuesday of each month, except June, July, August and September, Hotel Touraine, Boston, Mass.

NEW YORK RAILROAD CLUB.—D. W. Pye, 30 Church St., New York, N. Y. Regular meetings, third Thursday of each month, except June, July, August, September, and December, 29 W. 39th St., New York, N. Y.

PACIFIC RAILWAY CLUB.—William S. Wollner, P. O. Box A, Sausalito, Cal. Regular meetings, second Thursday of each alternate month, at Palace Hotel, San Francisco, and Hotel Hayward, Los Angeles.

RAILWAY BUSINESS ASSOCIATION.—P. H. Middleton (Executive Vice-Pres., Sec'y and Treas.), First National Bank Bldg., Chicago, Ill.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 1647 Oliver Bldg., Pittsburgh, Pa. Regular meetings, fourth Thursday of each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRIC SUPPLY MANUFACTURERS' ASSOCIATION.—J. McC. Price, Allen-Bradley Company, 600 W. Jackson Blvd., Chicago, Ill.

RAILWAY FUEL AND TRAVELING ENGINEERS' ASSOCIATION.—T. Duff Smith, Room 811, Utilities Bldg., 327 S. La Salle St., Chicago, Ill.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1647 Oliver Bldg., Pittsburgh, Pa.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with Telegraph and Telephone Section of A. A. R.

RAILWAY TIE ASSOCIATION.—Roy M. Edmonds, 903 Syndicate Trust Bldg., St. Louis, Mo.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—A. G. Shaver, 310 S. Michigan Ave. Annual meeting, September 15-17, 1942, Hotel Stevens, Chicago, Ill.

SIGNAL APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with A. A. R. Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, 4 Hunter St., S. E., Atlanta, Ga. Regular meetings, third Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta, Ga.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—D. W. Brantley, C. of Ga. Ry., Savannah, Ga.

TORONTO RAILWAY CLUB.—D. M. George, P. O. Box 8, Terminal "A," Toronto, Ont. Regular meetings, fourth Monday of each month, except June, July and August, Royal York Hotel, Toronto, Ont.

TRACK SUPPLY ASSOCIATION.—Lewis Thomas, Q. and C. Company, 59 E. Van Buren St., Chicago, Ill.

UNITED ASSOCIATION OF RAILROAD VETERANS.—Roy E. Collins, 112 Hatfield Place, Port Richmond, Staten Island, N. Y.

WESTERN RAILWAY CLUB.—E. E. Thulin (Executive Secretary) Room 822, 310 S. Michigan Ave., Chicago, Ill. Regular meetings, third Monday of each month, except January, June, July, August and September, Hotel Sherman, Chicago, Ill.

Supply Trade

Howard Prentice, sales engineer for the **Cleveland Frog & Crossing Co.,** Cleveland, Ohio, has been promoted to manager of sales, with the same headquarters.

James B. Hayden, sales manager of the **Industrial Brownhoist Corporation,** Bay City, Mich., has been elected vice-president in charge of sales. Mr. Hayden began his career in 1896 as a draftsman for the Walker Manufacturing Company, Cleveland, Ohio, and two years later became chief draftsman for the U. S. Commission to the Paris Exposition. In 1900 he entered the employ of the Brown Hoisting Machinery Company, Cleveland, as a draftsman and after holding the position of mechanical draftsman from 1900 to 1910, engineer in charge of the mechanical drafting department from 1910 to 1918 and manager of the power house equipment and ferroinclave sales for this company and its successor, The Industrial Brownhoist Corporation, from 1918 to 1932, was made assistant sales manager. After holding the latter position until 1939, he was promoted to sales manager, the position he was holding at the time of his recent election.

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Equipment and Supplies

SIGNALING

THE NORFOLK SOUTHERN has placed an order with the General Railway Signal Company covering materials for an all-relay interlocking at Edgeton (Raleigh), N. C. The order includes a desk-type control machine having two switch and two signal levers controlling two switches and 10 signals at a grade crossing of the Norfolk Southern with the Seaboard. In addition, the order calls for two large instrument cases, Type-K relays and rectifiers.

THE NORTHERN PACIFIC has placed an order with the General Railway Signal Company covering materials for an all-relay interlocking at Ainsworth Junction, Wash., to be controlled from Kennewick, Wash. The order includes a desk-type control machine having two switch and two signal levers for the control of two junction switches and 12 signals. The order also calls for one Model 5D dual-controller 20-volt switch machine, Type-K relays, copper-oxide rectifiers and transformers.

THE DELAWARE & HUDSON has placed an order with the General Railway Signal Company for materials to be used in a centralized traffic control coded system between "YO" cabin and Shea, N. Y., a distance of 1.9 miles, consisting of double track. The order includes a control machine at "YO" cabin, having 6 working levers for the control of 5 switches and 14 signals. Also included in the order are the coding equipment, 38 type-SA signals, two instrument housings, Types K and B relays, copper-oxide rectifiers and transformers.

THE TEXAS & PACIFIC has placed an order with the General Railway Signal Company covering material for centralized traffic control from Marshall, Tex. to Atlanta, a distance of 43 miles. This is a continuation of the ctc program started in 1936 to include all the territory between Texarkana, Tex. and Longview Jct. Besides three new panels for the existing control machine at Marshall, and the coding equipment, the order includes 10 Model 5D 20-volt dual-control switch machines, 10 Type SA searchlight signals, Type-K relays, and copper-oxide rectifiers.

TRADE PUBLICATION

LOCOMOTIVE COALING, SAND AND CINDER PLANTS.—The Ross and White Company, Chicago, has published a 12-page bulletin, No. 43, describing the full line of locomotive coaling, sanding and cinder plants manufactured by this company. The bulletin is attractively illustrated with large photographs and drawings, showing many types of installations of such facilities.

Financial

ATCHISON, TOPEKA & SANTA FE.—*Abandonment by the Oklahoma Central.*—The Oklahoma Central and the Atchison, Topeka & Santa Fe, respectively, would be authorized to abandon a line and the operation thereof extending from Purcell, Okla., to Chickasha, 41.2 miles, if Division 4 of the Interstate Commerce Commission adopts a proposed report of its Examiner T. K. Carpenter.

ATCHISON, TOPEKA & SANTA FE.—*Abandonment by the Gulf & Inter-State of Texas.*—The Gulf & Inter-State of Texas and the Gulf, Colorado & Santa Fe, respectively, have been authorized to abandon a line and the operation thereof extending from the ferry landing at Port Bolivar, Tex., to High Island, 26.7 miles. At the same time the Gulf, Colorado & Santa Fe was also authorized to abandon its ferry extending from the Ninth Street ferry landing in Galveston, Tex., to the ferry landing in Port Bolivar, 3.9 miles.

BOSTON & MAINE.—*Abandonment.*—This company has been authorized by Division 4 of the Interstate Commerce Commission to abandon a portion of its Central Massachusetts branch extending from Norwottuck, Mass., to Canal Junction, 8.5 miles.

CHICAGO & NORTH WESTERN.—*Abandonment.*—This company has been authorized by Division 4 of the Interstate Commerce Commission to abandon a line extending from Linwood, Nebr., southwesterly to Hastings, 102.6 miles. The authority was granted subject to the condition that the line, or any portion thereof, be sold to any responsible person, firm, or corporation offering within 40 days from the date of the certificate, to purchase it for continued operation, and willing to pay a price for the line not less than its fair net salvage value.

MISSOURI-KANSAS-TEXAS.—*Renewal of RFC Loan.*—Division 4 of the Interstate Commerce Commission has approved the extension of the time of payment for a period ending not later than December 30, 1944, of $2,314,239, and for a period ending not later than September 30, 1942, of $400,000 of the remainder, of a loan of $2,814,239 by the Reconstruction Finance Corporation to this company, which was due December 30.

Commissioner Mahaffie dissented, saying that he could not agree with the finding that the M. K. T. was not in need of financial reorganization. "Punctual payment of interest, so long as it is not at the expense of transportation," he declared, "is, of course, praiseworthy. The first obligation of a railroad, however, is to provide safe and adequate transportation. When the continuance of interest payments prevents or retards adequate maintenance or the acquisition of needed facilities the public interest, as I view it, requires that claims to interest yield."

NEW YORK CENTRAL.—*Acquisition and Operation.*—The Lake Erie, Alliance & Wheeling has asked the Interstate Commerce Commission for authority to acquire control of the Dillonvale & Smithfield through the purchase from the United States Coal Company of the road's entire capital stock for $200,000 in cash. At the same time the Lake Erie has requested authority to merge the Dillonvale & Smithfield into its company and to lease the property formerly owned by the Dillonvale & Smithfield to the New York Central, which is supplying the funds for the purchase.

In the same application the New York Central requests permission to acquire control of the Dillonvale & Smithfield; to operate its property, and to cancel its present operating agreement with the road.

NEW YORK, SUSQUEHANNA & WESTERN.—*Bond Interest.*—Judge William Clark of the federal district court at Newark, N. J., has authorized the trustee of this road to pay unpaid semi-annual interest on Terminal First Mortgage bonds of 1893 due May 1, 1937 to 1939, inclusive.

PENNSYLVANIA.—*Bonds.*—This road will meet maturities on January 1 of $2,584,000 of Cleveland & Pittsburgh general mortgage 4½s, Series A, and $1,100,000 in 30-year secured serial 4s (issued in 1934).

PITTSBURGH, LISBON & WESTERN.—*Acquisition.*—Division 4 of the Interstate Commerce Commission has denied a motion of the Pennsylvania, the Pittsburgh & Lake Erie, and the Baltimore & Ohio asking that the commission dismiss the recent application of this company for authority to purchase and operate a line of the Youngstown & Suburban between Signal, Ohio, and Columbiana, 6.5 miles. Details of the motion were given in last week's issue.

SOUTHERN PACIFIC.—*Equipment Trust Certificates.*—This company has asked the Interstate Commerce Commission for authority to assume liability for $4,430,000 of 2½ per cent equipment trust certificates, maturing in 10 equal annual installments of $443,000 on January 1 in each of the years from 1943 to 1952, inclusive. The proceeds will be used as part of the purchase price of new equipment costing a total of $5,563,681 and consisting of 700 steel sheathed, wood-lined box cars; 700 all-steel, drop bottom gondola cars; 150 70-ton Hart Selective hopper bottom steel ballast cars; 100 12,500 gallon steel tank cars; 100 12,500 gallon steel tank cars with heater coils; and 50 8,000 gallon steel tank cars with heater coils.

The issue has been sold at 100 per cent plus accrued dividends and a premium of $100 to the First Boston Corporation, acting for itself and on behalf of Harriman Ripley & Co., Inc.; F. S. Moseley & Co.; and Kidder, Peabody & Co., subject to commission approval.

Abandonment.—This company has requested I. C. C. authority to abandon 0.7 mile of line in Alameda, Calif.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—*Pledge and Extension of Bonds.*—This company has asked the Interstate Commerce Commission for authority to pledge with the Central Hanover Bank & Trust Company, as trustee under the general mortgage of the Terminal Railroad Association of St. Louis, dated December 16, 1902, bonds in the amount of $2,000,000

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Steel comes first... Without Steel there can be no plowing, no harvesting, no food; no ships, no railroad cars—no transportation; no clothing; no guns, no shells, no airplanes. Steel is the raw material. Steel is the tools and machinery of production... The demands of war have widened our research—and given us results of value now as well as when the victory is won.

ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS: CONSHOHOCKEN, PA. District Offices and Representatives: Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, St. Paul, New Orleans, Pittsburgh, Roanoke, Sanford, N. C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal.

issued by the St. Louis Merchants Bridge under its first mortgage, and bonds in the amount of $3,500,000 issued by the St. Louis Merchants Bridge Terminal under its first mortgage to the St. Louis Trust Company, trustee, dated October 1, 1890.

Also, the St. Louis Merchants Bridge Terminal has asked the commission for authority to extend the time of payment of $3,500,000 of its first mortgage five per cent bonds from October 1, 1930, to July 1, 1974, with the interest rate remaining unchanged.

In another application filed at the same time the St. Louis Merchants Bridge has sought authority to extend the time of payment of $2,000,000 of its first mortgage six per cent bonds from February 1, 1929, to July 1, 1974, with the interest remaining unchanged.

The St. Louis Terminal has also requested permission to extend from January 1, 1933, to January 1, 1953, the time of payment of $1,500,000 of its first mortgage six per cent, 40-year bonds, with the interest rate remaining unchanged.

Lastly, the Terminal Railroad Association of St. Louis seeks authority to extend to January 1, 1953 the lease to it of the properties of the St. Louis Terminal.

Construction

ERIE.—The New York Public Service Commission has designated for elimination the grade crossing of this company at Buffalo St. in the city of Olean, N. Y. The general plan of the improvement provides for the elimination by raising the railroad tracks about nine inches and carrying Buffalo St. under the railroad by means of a subway. The bridge over the subway is to be made up of deck beams encased in concrete and supported on reinforced concrete box-type abutments. The railroad estimated the cost of construction at $160,000.

NORFOLK & WESTERN.—A new westbound time freight classification yard is being constructed at Portsmouth, Ohio. The new yard is being built at a cost of $600,000 and will include 18 tracks from 1,000 to 2,000 ft. long. In order to make room for the new yard, the old westbound coal receiving yard had to be rebuilt south of its original position. The new yard will have a hump with car retarders and signal systems in the classification and receiving yards to facilitate operation.

PENNSYLVANIA.—This company's coal storage capacity at South Amboy, N. J., will be increased 25 per cent when the new track facilities now under construction there are completed early in 1942. The project, which is being carried out under the direction of the chief engineer, maintenance of way, R. R. Nace, involves the construction of six new tracks with a capacity of 70 cars at South Amboy; 15 tracks with a capacity of 287 cars at a point approximately one mile west of South Amboy; and 13 tracks with a capacity of 639 cars at Runyon, N. J., six miles south of South Amboy.

Railway Officers

EXECUTIVE

Harry W. Von Willer, assistant to the vice-president in charge of traffic of the Erie, has been promoted to assistant vice-president, with headquarters as before at Cleveland, Ohio, a newly created position. A photograph and biography of Mr. Von Willer were published in the *Railway Age* of January 11, 1941, following his promotion to assistant to the vice-president.

James M. Nicholson, general assistant in the mechanical department of the Atchison, Topeka & Santa Fe at Chicago, has been promoted to assistant to the operating vice-president (mechanical), with the same headquarters, succeeding **John Purcell,** who retired on January 1, after 57 years of service. A photograph and biography of Mr. Nicholson were published in the *Railway Age* of July 19, following his promotion to general assistant in the mechanical department.

Robert M. Edgar, assistant general freight agent of the Boston & Maine, with headquarters at Boston, Mass., has been

Robert M. Edgar

promoted to assistant to vice-president of that road and the Maine Central. Mr. Edgar was graduated from Dartmouth in 1928 and entered the service of the Boston & Maine as a rate clerk in January, 1929. In 1936 he went with the Montpelier & Wells River and the St. Johnsbury & Lake Champlain as assistant general freight agent. He returned to the Boston & Maine in January, 1938, as commerce agent and in June, 1938, he was again promoted to division freight agent of the New Hampshire division at Concord, N. H. Mr. Edgar was promoted to assistant general freight agent at Boston in January, 1941.

J. E. Crawford, vice-president—assistant to president of the Norfolk & Western, with headquarters at Roanoke, Va., retired on January 1 at his own request, after more than 38 years of continuous service. **R. H. Smith,** vice-president and general manager, has been appointed vice-president in charge of operation, with headquarters as before at Roanoke. The positions of vice-president—assistant to president and vice-president and general manager have been abolished.

Mr. Crawford was born at San Diego, Cal., on December 1, 1876, and was educated at the University of Pennsylvania, receiving the degree of B. S. in C. E. in 1897. He was employed by the American Bridge Company from 1895 to 1903 as

J. E. Crawford

draftsman and designer. In July, 1903, Mr. Crawford entered the service of the Norfolk & Western as bridge engineer, remaining in that capacity until May, 1913, when he was promoted to chief engineer. He was appointed assistant general manager in February, 1923, and the following year became general manager. He was promoted to vice-president in charge of operation on December 1, 1936, and in May, 1939, he was appointed vice-president—assistant to president, the position he held until his retirement.

R. Knox Bradford, assistant general manager on the Denver & Rio Grande Western, with headquarters at Denver, Colo., has been promoted to executive assistant to the trustees, in charge of Utah operations, with headquarters at Salt Lake City, Utah. Mr. Bradford will have charge of a new office in the latter city, created to

R. Knox Bradford

handle the large increase in traffic in this area. Mr. Bradford was born at Pine Bluff, Ark., on May 30, 1896, and attended Randolph-Macon Academy, Bedford, Va. He entered railway service in February,

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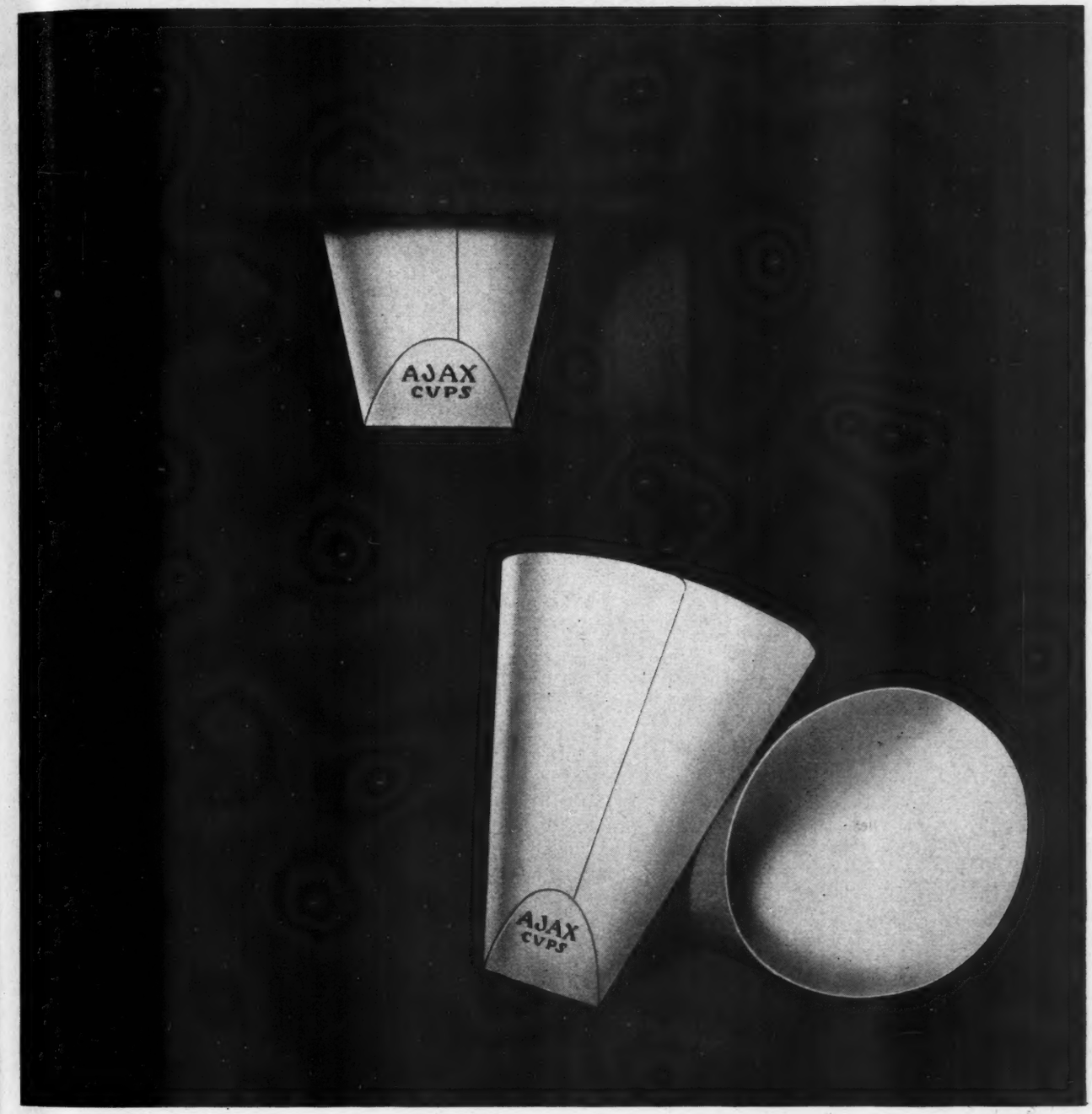

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1913, as a mail and file clerk on the Chicago, Rock Island & Pacific at Des Moines, Iowa, later serving as secretary to the superintendent at Cedar Rapids, Iowa, master carpenter's clerk and voucher clerk at Little Rock, Ark., and dispatcher's clerk at Cedar Rapids. In July, 1915, he went with the St. Louis-Southwestern as chief clerk to the assistant superintendent at Pine Bluff, later serving successively as chief clerk to the general claim agent and general car distributor at that point. In October, 1916, he returned to the Rock Island as secretary to the superintendent at Little Rock, later serving as secretary to the assistant general manager at El Reno, Okla., and car distributor at Little Rock. From December, 1917, to February, 1919, he served in the U. S. Army, returning to the Rock Island on the latter date as assistant chief clerk to the superintendent at Little Rock. Mr. Bradford then served successively as stock claim agent at Little Rock, secretary to the general manager at Chicago, chief clerk to the vice-president and general manager at Chicago and trainmaster at Amarillo, Tex. In August, 1923, he was appointed staff officer to the receiver of the Denver & Rio Grande Western at Denver, subsequently being advanced to assistant to the receiver, assistant to the general manager, assistant superintendent of transportation and in 1927 to superintendent of transportation. On October 8, 1938, he was appointed an examiner for the Railroad division of the Reconstruction Finance Corporation at Washington, D. C., and on November 1, 1939, he returned to the D. & R. G. W. as assistant general manager, with headquarters at Denver, the position he held until his recent promotion effective January 1.

FINANCIAL, LEGAL AND ACCOUNTING

H. J. Peterson has been appointed acting auditor of freight accounts of the Union Pacific, with headquarters at Omaha, Neb., succeeding **J. W. White.**

Charles Howard Anderson, tax agent on the Atchison, Topeka & Santa Fe at Chicago, has been promoted to commissioner of taxes and manager of insurance, with the same headquarters, succeeding **George G. Tunell,** who retired on January 1, after 36 years of service.

Earl C. Iden, attorney for the Atchison, Topeka & Santa Fe at Albuquerque, N. M., has been appointed solicitor for New Mexico, with the same headquarters, succeeding his law partner **Capt. William C. Reid,** whose death on December 1 was reported in the *Railway Age* of December 6, and **Quincy D. Adams,** acting district attorney at Albuquerque, has been appointed attorney for the Santa Fe at that point, relieving Mr. Iden.

OPERATING

John P. Mumford has been appointed assistant trainmaster of the Southern, with headquarters at Birmingham, Ala.

V. R. Adkins has been appointed assistant superintendent of the St. Louis Terminal division of the Missouri Pacific, with headquarters at Dupo, Ill., succeeding **W. L. Ferrick,** who retired on January 1.

Charles Warren Hammond, assistant general safety agent of the New York Central system, with headquarters at New York, retired from active service on December 31, after more than 50 years of service.

P. W. Archibald has been appointed trainmaster on the Atchison & Santa Fe at Fresno, Cal., succeeding **W. L. More,** whose promotion to superintendent of the San Francisco terminal division, with the same headquarters, was reported in the *Railway Age* of December 20.

Frank Cizek, superintendent of the Syracuse and Utica division of the Delaware, Lackawanna & Western, with headquarters at Binghamton, N. Y., has been appointed superintendent of safety, with headquarters at New York. The Syracuse and Utica division at Binghamton will be discontinued and combined with the Scranton division.

Harvey A. McDaniel, whose promotion to superintendent of the Idaho division of the Union Pacific, with headquarters at Pocatello, Idaho, was reported in the *Railway Age* of December 13, was born in Brown county, Tex., on January 15, 1889, and entered railway service on February 1, 1907, with the Atchison, Topeka & Santa Fe. From that date until August 15, 1909, he served as a brakeman and switchman on the Santa Fe, the Missouri Pacific and the Denver & Rio Grande Western, going with the Union Pacific on the latter date as a brakeman. Mr. McDaniel subsequently served as a conductor, traveling conductor and trainmaster and in August, 1941, he was promoted to assistant superintendent at Pocatello, the position he held until his recent promotion.

J. P. Jackson, superintendent of the Pocahontas division of the Norfolk & Western, with headquarters at Bluefield, W. Va., has been promoted to general superintendent of the Eastern general division, with headquarters at Roanoke, Va., succeeding **O. M. Dawson,** who has been transferred to the Western general division, with headquarters at Bluefield. **H. C. Wyatt,** superintendent of the Scioto division at Portsmouth, Ohio, has been transferred to the Pocahontas division, succeeding Mr. Jackson, **C. P. Blair,** assistant superintendent of the Scioto division at Portsmouth, has been promoted to superintendent of that division. **W. H. Jackson,** trainmaster of the Radford division at Roanoke, has been promoted to assistant superintendent of the Scioto division at Portsmouth.

George C. Fish, whose promotion to superintendent of the Utah division of the Union Pacific, with headquarters at Salt Lake City, Utah, was reported in the *Railway Age* of December 13, was born in Claysville, Pa., on February 18, 1900, and attended Washington & Jefferson College in 1920 and Stanford University in 1921. He entered railway service on June 15, 1919, as a clerk-warehouseman on the Union Pacific at West Yellowstone, Mont., and served later as a baggage and express agent at that point. In 1923 he was transferred to Pocatello, Idaho, where he served in the operating, maintenance and accounting departments and in 1927 he was appointed secretary to the general manager at Los Angeles, Cal. Mr. Fish was appointed safety agent at Los Angeles in 1936 and in 1937 and 1938 he served successively as chief clerk to the traffic manager, secretary to the terminal superintendent and secretary to the traffic manager. In 1939 he was appointed trainmaster at Las Vegas, Nev., and on August 1, 1941, he was advanced to assistant to the general manager at Salt Lake City, which position he held until his recent promotion, effective December 1.

J. R. Talbott, superintendent of transportation of the Norfolk & Western, has been promoted to general superintendent of transportation, with headquarters as before at Roanoke, Va. **K. V. Conrad,** assistant superintendent of transportation, has been promoted to superintendent of transportation. **R. A. Littrell,** special representative of the superintendent of transportation, has been promoted to assistant superintendent of transportation.

C. H. Tabor, general superintendent of the Norfolk & Western, with headquarters at Bluefield, W. Va., has been promoted to general manager, with headquarters at Roanoke, Va., succeeding **R. H. Smith,** whose appointment as vice-president in charge of operation is noted elsewhere in these columns. Mr. Tabor began his railroad career on May 1, 1907, as water boy on the Pocahontas division of the N. & W. Two years after he was promoted to timekeeper and in November, 1911, he

C. H. Tabor

became yard clerk at Wilcoe, W. Va. On April 20, 1917, he was promoted to assistant yardmaster at Wilcoe. Following two years of overseas service during the World War, he returned to the Norfolk & Western in July, 1919, as yardmaster at Iaeger, W. Va. Mr. Tabor was appointed general yardmaster at Wilcoe in February, 1925, and continued in that capacity for two years, then being promoted to assistant trainmaster of the Pocahontas division. He became terminal trainmaster at Bluefield in 1933 and was appointed trainmaster of the Pocahontas division on October 1, 1934, being transferred in the same capac-

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Trend of the Future

INDICATED BY THE DEMANDS OF TODAY

COMPANY BRIDGEVILLE, PENNSYLVANIA

ity to the Scioto division in 1936. Mr. Tabor was appointed superintendent of the Pocahontas division on December 1, 1936, and was transferred in the same capacity to the Scioto division on July 25, 1938. Mr. Tabor was appointed assistant general superintendent of the Western General division at Bluefield in June, 1939, and in April, 1940, he became general superintendent of that division, the position he held until his recent promotion.

TRAFFIC

O. C. Olsen, assistant general freight agent on the Missouri Pacific at St. Louis, Mo., has been appointed rate adjustor in the commercial department of the Board of Port Commissioners of New Orleans, La., with headquarters at that point.

C. E. Scott, general eastern agent of the St. Louis Southwestern, has been appointed eastern traffic manager, with headquarters as before at New York. **H. T. Rosemyer,** commercial agent, has been appointed general agent with headquarters as before at New York.

P. A. Spiegelberg, whose promotion to assistant freight traffic manager on the Wabash, with headquarters at St. Louis, Mo., was reported in the *Railway Age* of

P. A. Spiegelberg

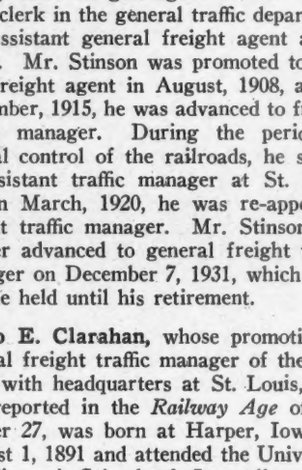
December 27, was born at St. Louis on April 8, 1895, and attended St. Paul's College, Concordia, Mo. He entered railway service on November 16, 1911, as a clerk in the freight accounting department of the Wabash. During the first World War he served overseas in the U. S. Army, afterward returning to the freight accounting department. On May 1, 1920, he was appointed statement clerk and later was advanced successively to assistant chief clerk, chief clerk, assistant to the general freight traffic manager and assistant general freight agent at St. Louis, holding the latter position at the time of his recent promotion, which was effective January 1.

Charles H. Stinson, general freight traffic manager of the Wabash, with headquarters at St. Louis, Mo., whose retirement on January 1 was reported in the *Railway Age* of December 27, was born at Beaver Falls, Pa., on November 19, 1871, and entered railway service on January 1, 1887, as a yard messenger for the Chicago, Milwaukee, St. Paul & Pacific at Chicago, later serving in the local freight office. In January, 1891, he went with the Wabash in the general office of the Hoosac Tunnel Fast Freight line, later serving successively as clerk in the division office of the Wabash, contracting agent, traveling freight agent, and line agent; chief clerk, cashier and general accountant in the general

Charles H. Stinson

office of the Hoosac Tunnel line at Chicago; chief clerk in the office of the assistant general freight agent at St. Louis, chief clerk in the general traffic department and assistant general freight agent at St. Louis. Mr. Stinson was promoted to general freight agent in August, 1908, and in December, 1915, he was advanced to freight traffic manager. During the period of federal control of the railroads, he served as assistant traffic manager at St. Louis and in March, 1920, he was re-appointed freight traffic manager. Mr. Stinson was further advanced to general freight traffic manager on December 7, 1931, which position he held until his retirement.

Leo E. Clarahan, whose promotion to general freight traffic manager of the Wabash, with headquarters at St. Louis, Mo., was reported in the *Railway Age* of December 27, was born at Harper, Iowa, on August 1, 1891 and attended the University of Missouri School of Journalism. He entered railway service on August 10, 1912,



Leo E. Clarahan

as a freight clerk and trucker on the Wabash at Columbia, Mo., later being advanced to chief clerk and then to division freight and passenger agent at Moberly, Mo. In March, 1915, he was transferred to Des Moines, Iowa, and seven months later, he was appointed chief clerk to the general freight agent at St. Louis. From June, 1917, to February, 1919, during the first World War, Mr. Clarahan served in the U. S. Navy, returning to the Wabash on the latter date as traveling freight inspector at St. Louis. In March, 1920, he was promoted to division freight agent at Des Moines and in June, 1921, he was transferred to Omaha, Neb. Mr. Clarahan was advanced to general industrial agent at St. Louis in January, 1927, and in February, 1933, he was appointed assistant general freight agent. In March, 1937, he was promoted to general freight agent and in January, 1938, he was further advanced to assistant freight traffic manager, the position he held until his recent promotion, effective January 1. Mr. Clarahan is the author of the book "So You're a Salesman Now."

John G. Hill, general freight agent on the Erie, with headquarters at Chicago, has been promoted to assistant freight traffic manager, with the same headquarters, and the position of general freight

John G. Hill

agent at that point has been abolished. **James M. Skaehill,** division freight agent at Cleveland, Ohio, has been advanced to assistant general freight agent, with the same headquarters, and the position of division freight agent at that point has been abolished.

Mr. Hill was born at Pleasant Plain, Ohio, on April 8, 1877, and entered railway service at the age of 15 as a telegraph operator on the Cincinnati, Hamilton & Dayton at Carthage, Ohio, later serving as telegraph operator and clerk in the accounting and legal departments of the Baltimore & Ohio Southwestern (both now parts of the Baltimore & Ohio). During 1896 Mr. Hill was a reporter on the Cincinnati (Ohio) Commercial Tribune, then becoming correspondence clerk in the general freight office of the B. & O. at Cincinnati early in 1897. After serving on nearly every clerical desk in the general freight office, including that of assistant chief clerk, he became western sales agent of the Lehigh Portland Cement Company in January, 1902. From 1905 to 1918 he advanced

Continued on third right-hand page

successively on the Cincinnati, New Orleans & Texas Pacific (Queen & Crescent) through the position of traveling freight agent in Ohio, Indiana and Michigan to commercial agent at Indianapolis, Ind., at Pittsburgh, Pa., and at Chicago. When the Queen & Crescent was consolidated with the Southern he became commercial agent for the Southern at Chicago. During the World War he was in charge of troop train movements and later of terminals at Chattanooga, Tenn. On March 20, 1920, Mr. Hill was appointed general agent of the Erie at Chicago, being transferred to St. Louis in 1921 and advanced to assistant general freight agent at Chicago in 1923. On December 1, 1928, he was promoted to general freight agent at Chicago, which position he held until his recent promotion.

Paul R. Farlow, agricultural agent for the Illinois Central, with headquarters at Chicago, has been promoted to general agricultural agent, with the same headquarters, succeeding **Henry J. Schwietert,** who retired on January 1 after 37 years service.

ENGINEERING AND SIGNALING

H. R. Hart, assistant division engineer on the Atchison, Topeka & Santa Fe, with headquarters at San Francisco, Cal., has been promoted to division engineer of the newly created San Francisco terminal division, with the same headquarters.

John J. Clutz, division engineer of the Indianapolis division of the Pennsylvania, with headquarters at Indianapolis, Ind., has been transferred to the Washington terminal, with headquarters at Washington, D. C., and **L. G. Walker, Jr.,** assistant division engineer of the Ft. Wayne division, has been promoted to division engineer at Indianapolis, succeeding Mr. Clutz.

Jesse P. Walton, assistant engineer of bridges and buildings of the Central region of the Pennsylvania, with headquarters at Pittsburgh, Pa., has been promoted to engineer of bridges and buildings of the Western region, with headquarters at Chicago, succeeding **Einar Weidemann,** whose death on November 12 was reported in the *Railway Age* of November 15. **Edward W. Prentiss,** designing engineer at Chicago, has been advanced to assistant engineer of bridges and buildings of the Western region, with the same headquarters, a newly created position.

MECHANICAL

M. G. Stewart, assistant road foreman of engines of the Williamsport division of the Pennsylvania, has been promoted to road foreman of engines of the Washington Terminal company.

J. E. Goodwin, master mechanic on the International-Great Northern (part of the Missouri Pacific lines), with headquarters at San Antonio, Tex., has been promoted to mechanical superintendent, Southern district, of the Missouri Pacific, with headquarters at St. Louis, Mo., succeeding **William H. McAmis,** whose death at Chicago on December 17, was reported in the *Railway Age* of December 20.

William Moore, shop superintendent of the Hornell back shop of the Erie at Hornell, N. Y., has been promoted to assistant to the superintendent of motive power, with headquarters at Cleveland, Ohio, succeeding **W. E. Harmison,** who has been appointed superintendent of the car department. Mr. Harmison relieves **John McMullen,** who has been appointed consulting engineer, a newly-created position. **G. R. Seitz** has been appointed shop superintendent of the Hornell back shop, replacing Mr. Moore.

SPECIAL

Frank D. O'Dea, chief of police of the Eastern district of the Erie, with headquarters at Jersey City, N. J., has been appointed acting superintendent of property for the system, with headquarters at Cleveland, Ohio, succeeding **W. J. Redman,** who has been granted a leave of absence because of ill health.

OBITUARY

William J. Edwards, at one time general superintendent on the Southern, Lines West, with headquarters at Chattanooga, Tenn., and later, in 1926 and 1927, assistant to the general manager, Lines West, with headquarters at Birmingham, Ala., died on December 19 in the latter city after a long illness.

C. W. Cook, master mechanic for the Seaboard at Atlanta, Ga., died on December 19.

Bernard L. Robey, assistant auditor of freight accounts for the Southern, with headquarters at Atlanta, Ga., died on December 18 of a heart attack at his home in that city, at the age of 46.

Charles A. Clements, assistant general manager on the Missouri Pacific, with headquarters at St. Louis, Mo., died of a cerebral hemorrhage in that city on December 18.

Edgar J. McClees, former executive secretary of the Bureau of Information of the Eastern Railways, with headquarters at New York, died on December 25 at his home in Drexel Park, Philadelphia, Pa., at the age of 66. Mr. McClees was born at Philadelphia, Pa., on March 31, 1875, and entered railroad service in September, 1890, as telegraph operator on the Pennsylvania, holding various positions in the general headquarters at Philadelphia until 1912 when he was furloughed to do special work with the Conference Committee of Managers, Eastern Railroads. In May, 1914, Mr. McClees became chief clerk, Bureau of Information of the Eastern Railways. During federal control of the railroads he served as chief of the Labor Bureau, Eastern region. In 1919 Mr. McClees became assistant secretary, Bureau of Information, becoming secretary in charge in 1922. In 1936 he became executive secretary of the Bureau, retaining his position with the Pennsylvania until his retirement a year ago. Mr. McClees represented the railroads of the United States at the International Labor Organization Conference, Geneva, Switzerland, by appointment of the Secretary of State in 1939.

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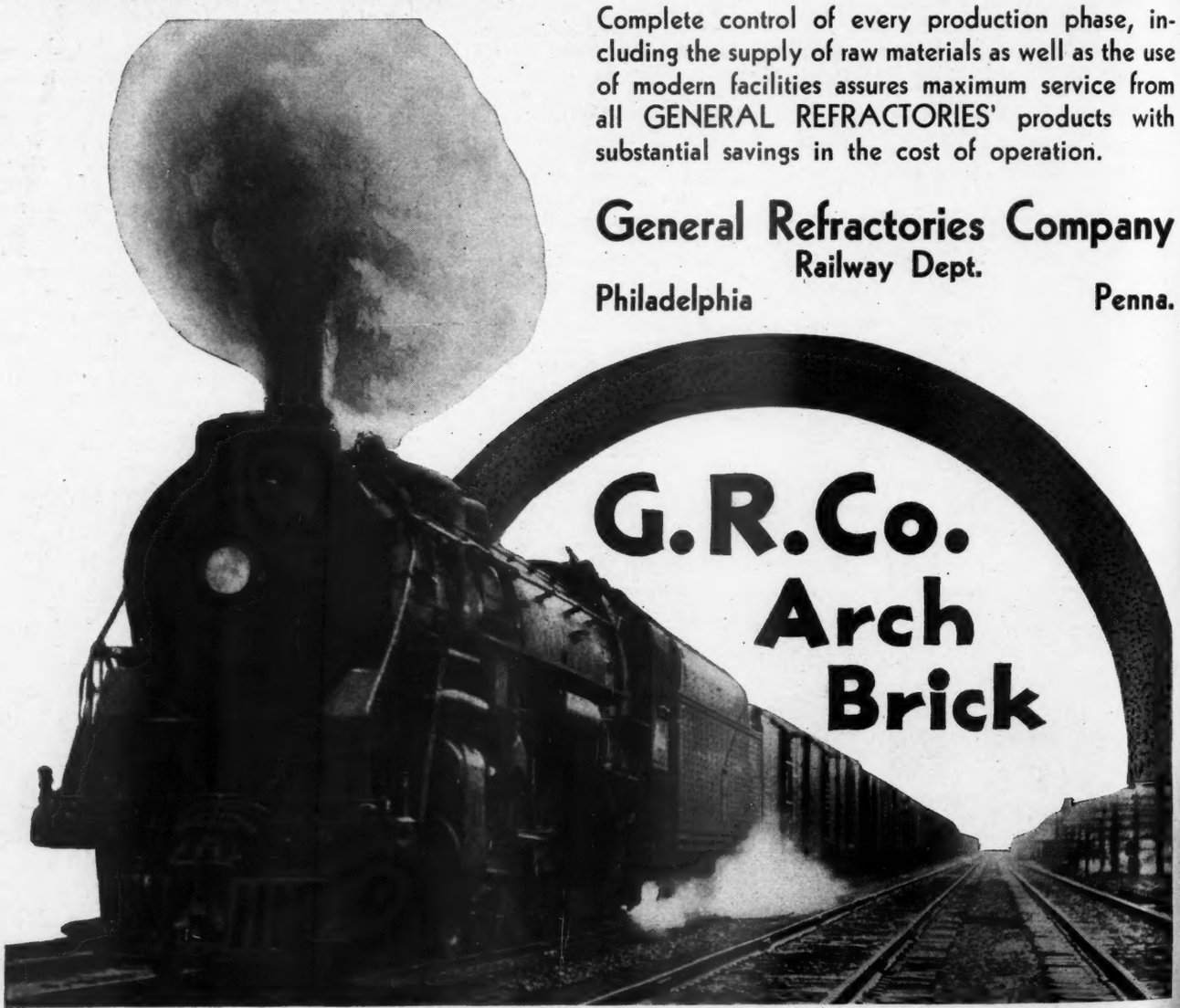
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